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13. ABSTRACT (Maximum 200 words)

In 1995, TRADOC initiated the analytical process described in the March 1995 draft Joint Venture (JV) Campaign Plan. The resulting analyses provide the basis for redesigning today's Warfighting Army for the 21st century. The combat unit elements, combat service elements, and the combat service support elements needed to be analyzed individually to determine whether or not each of these sections would be able to effectively perform under the given scenario conditions. TRAC-Lee was tasked to analyze the CSS capabilities of the three (3) division designs (Conservative Heavy, Strike, Brigadier) for DDA Phase III. The three division designs were dynamically gamed using the Vector-in-Commander model in the LANTICA III, Northeast Asia 2.0, and Southwest Asia 4.2 scenarios. The CSS elements represented in VIC were analyzed by TRAC-Lee with the primary focus of the analysis was on the maintenance and supply operations and how the CSS units functioned for the given scenario.

This analysis concluded that the CSS structure in the Brigadier Division can support the division during a 60-hour battle such as the one portrayed in the Northeast Asia 2.0 scenario. There was one problem area in the CSS component that was focused on in this analysis. Some of the artillery units used all of their ammunition reserves and were not resupplied in a timely manner.

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STUDY TITLE: Combat Service Support (CSS) Vector-in-Commander (VIC) Analysis in Support of Force XXI Analyses Division Design Analysis – Phase III CSS Analysis of VIC Dynamic Gaming Brigadier Division Interim Design (North East Asia 2.0)

PURPOSE: The purpose of this analysis was to produce quantitative analysis of the Brigadier Division Interim Design's combat service support (CSS) structure which was dynamically gamed in the North East Asia 2.0 scenario with the VIC model. The focus of the analysis was on the maintenance and supply operations and how the CSS units functioned for the given scenario.

MAIN ASSUMPTIONS: The principal assumptions of this study include: (a) all repair parts were available upon request, (b) Echelons-Above-Division (EAD) were fully resourced, and (c) CSS enablers and other technological equipment are present.

PRINCIPAL FINDINGS: The CSS structure in the Brigadier Division could support the division during the 60-hour battle in the NEA 2.0 scenario with one exception. Several artillery units expended all of their ammunition resources at some time during the scenario and could not be resupplied in a timely manner.

IMPACT: This report suggests that the CSS structure in the Brigadier Division is sufficient to sustain the division in a scenario such as the one portrayed in NEA 2.0.

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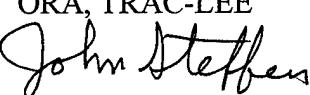
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Division Design Analysis -- Phase III CSS Analysis of VIC
Dynamic Gaming Brigadier Division Interim Design
(North East Asia 2.0).
Technical Report



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Combat Service Support (CSS)
Vector-in-Commander (VIC) Analysis
in Support of Force XXI Analyses

Division Design Analysis -- Phase III
CSS Analysis of VIC Dynamic Gaming
BRIGADIST Interim Design (NEA 2.0)
28AUG97 VIC Analysis Data

1. General.

a. The Commanding General (CG) Training and Doctrine Command (TRADOC) tasked the TRADOC Analysis Center (TRAC) to conduct an analysis of the Combat Service Support (CSS) Division redesign concept. TRAC at Fort Lee, Virginia (TRAC-LEE) used Vector-in-Commander (VIC) analysis to provide quantitative analysis of that concept.

b. The dynamic gaming with the VIC model is based on the NEA 2.0 scenario with a total duration of 60 hours incremented in four hour time periods (TP) and four (4) hour reorder cycle time between CSS units. The modeled force consists of three brigades with a corps slice. Specific descriptions and details for both the scenario and modeled force are provided in the main report.

c. The analysis focuses first on those key maneuver unit resources necessary for a unit to perform its designated mission. The specific resources addressed are weapon system availability and the timely availability of supplies. Secondly, various aspects of the CSS system are examined to isolate bottlenecks or shortages which limit the provision of needed services. And conversely, excesses or under-utilized CSS resources are identified for this scenario.

d. The analysis entails two major areas: maintenance support and supply support. Since the medical support system for the treatment of personnel is very similar in function to that of the maintenance system, medical support is addressed along with maintenance.

e. VIC unit name designators are used in this report for brevity. Appendix A shows the cross reference between actual unit names and VIC unit names.

2. Model Description.

a. The Vector-in-Commander (VIC) model is a two-sided, deterministic simulation of integrated land and air combat. The level of resolution is the maneuver battalion. As a deterministic model, VIC relies upon expected values; weapon systems, transporters, inventories/stockage levels, and consumption can be fractional values. VIC is event stepped for maneuver elements and both time stepped and event stepped for calculation of combat service support (CSS) effects. The combat and combat support (CS) functions in VIC produce a workload for the CSS system. Two key modules within VIC are used to represent the CSS system: Return to Duty (RD - maintenance) and Logistics (LO - supply).

b. The return-to-duty (RD) module operates on equipment and noncrew personnel, both of which are referred to as systems, as well as crews for key combat vehicles.

(1) Workloads. The attrition modules generate combat casualty workload in the form of combat-damaged systems. These quantities are adjusted to factor out catastrophic damage/killed in action (KIA) and abandonments (equipment only) before becoming a workload on the RD system. Reliability failures to equipment and disease and nonbattle injury (DNBI) to personnel are also generated, resulting in their removal from units and their introduction as workload upon the RD system.

(2) Processes. The RD module contains representations of the recovery, evacuation, and repair functions.

(a) Recovery is constrained by the availability of operational recovery vehicles. Recovery operations are represented as a delay time of 57 to 96 minutes which includes round trip travel, hook-up, and drop-off. The recovery time varies from vehicle to vehicle and the primary location of that vehicle.

(b) Evacuation is constrained by the availability of operational evacuation vehicles and dynamic evacuation times that are a function of distance and time on the main supply route (MSR) network.

(c) Repair is constrained by the available strength and type of assigned mechanics or medical personnel. Of course repair throughput is impacted by the 'time to repair' but repair time is determined by design factors and not CSS. A maintenance unit's maintenance man-hours (MMH) is degraded by fifty percent when that unit has to relocate on the battlefield. This degradation is calculated to the nearest quarter of an hour; therefore, a maintenance unit's MMH during a portion of a TP could be degraded while the remaining MMH are unaffected. The degradation of MMH availability is based on the premise that a maintenance facility will have only 50 percent of its assets (to include personnel) fully functioning at any time during a battlefield relocation.

(3) Products. The final product of the RD module is the return of crewed systems to owning units. Intermediate products of the various RD processes include recovered systems, evacuated systems, and repaired systems.

(4) Combat impacts on RD processes. Impacts include attrition of RD assets, productivity degradation due to unit movement, changes in evacuation distances due to unit movements, and changes in evacuation speeds due to congestion of MSR links.

c. The logistics (LO) module provides the support structure to facilitate the resupply of ammunition, fuel, and other supplies to maneuver units and the restocking of these supplies at supply units.

(1) Workloads. The attrition modules dynamically generate the workload for ammunition as units engage in conflict. As units move and change posture they create a workload for fuel. A workload for other supplies is generated by a daily consumption rate, depending upon unit types. When maneuver units deplete their basic loads to specified reorder levels, a requirement for resupply is levied on the CSS system.

(2) Processes. The LO module contains representation of the resupply and move functions. Resupply to maneuver units is constrained by the availability of resupply vehicles, availability of supplies at supply units, load times, and travel time between the unit and its supplier. The availability of supplies at supply points is constrained by transportation, availability of load facilities, and load/unload times. The move function is constrained by the availability of CSS trucks, congestion of the MSRs, and travel times between supply units.

(3) Products. The final product for the resupply and distribution system is the replenishment of expended ammunition, fuel, and other supplies to maneuver units. Intermediate products include the restocking of resupply units and the movement of supplies along the MSRs from higher echelon supply units.

(4) Combat impacts on LO processes. Attrition and movement of supply units as a result of combat effects degrade the ability of these units to perform their resupply function. Resources which can be lost at the supply units include resupply vehicles, stocks, and materiel-handling equipment (MHE). The relocation of supply units results in degradation of their receipt/issue capability during the move. In addition, attrition of resupply vehicles, both at the maneuver unit and along the MSRs, degrades the ability of the CSS system to deliver supplies.

3. Assumptions.

- a. Maintenance characteristics and parameters of all systems remain constant across the scenario.
- b. When damaged weapon systems reach a maintenance facility, the correct tools, parts, and equipment are present at the facility. If the number of mechanics necessary to work on the damaged weapon system is available, they will begin working on the damaged weapon system immediately (i.e., prep time and time spent for damage assessment are not played in the model).
- c. The DNBI rate remains constant across the scenario.
- d. Resupply of all stockage items is available from echelons above corps (EAC).

4. Sufficiency Criteria.

- a. Equipment. Maintain 80 percent availability of systems that have not been destroyed or abandoned. Rationale: Army Regulation (AR) 220-1, Unit Readiness Reporting, defines an equipment availability status of 80-90 percent as category C2 which is fully combat ready with minor risk.
- b. Personnel.
 - (1) Have no weapon systems in awaiting-reissue queue due to nonavailability of crews. Rationale: The availability of weapon systems crews affects the availability criterion for combat systems.
 - (2) Maintain 80 percent personnel strength level for all modeled personnel. Rationale: AR 200-1 defines a personnel strength level of 80-90 percent as category C2 which is combat ready with minor risk.
- c. Supply. Have no zero balance of any supply-class subitem (e.g., 155mm, 120mm, POL). Rationale: The lack of a specific type could adversely affect tactical options.

5. Maintenance Analysis.

- a. The six weapon system categories covered in this analysis are shown in table M-1. The Fixed Wing category was not represented in the CSS system. In addition, medical treatment of personnel and weapon crews are presented as a separate category.

Category	Weapon System
TANK	M1A2/120
AFV	M2A3/TOW FSCS/45 BSFV-E M3A3/TOW
ADA	AVENGER
MLRS	MLRS_D
CANNON	CRUSADER-D
HELICOPTERS	AH64D RAH66D RAH66

Key Weapon Categories
Table M-1

b. The primary maintenance performance measure at the maneuver unit level is availability of unit weapon systems. Availability of unit weapon systems is determined by the current strength of weapon systems at a maneuver unit versus the initial strength less the number of catastrophically killed weapon systems at the same maneuver unit. The number of weapon systems available is a function of many dependent and interdependent factors. These factors can be partitioned into two groups: (1) those factors which render weapon systems inoperable: combat damage and reliability and (2) factors that contribute to the return of repaired systems to combat. When more weapon systems are returned to combat, a larger population is available for combat and reliability failure, which in turn workloads the Return-to-Combat (RTC) support system.

(1) Factors which cause weapon systems to become inoperable are combat damage and reliability failures. Combat damage is a function of the interaction of opposing forces resulting in catastrophic kills and repairable battle damage. The percentage of catastrophic kills versus the percentage of repairables varies by weapon system due to threat weapons and survivability characteristics. Table M-2 shows the percent repairable for each system once combat damaged. The percentages are not measures of overall survivability but are conditional results based on a weapon system first being combat damaged. Overall survivability also involves the likelihood of a weapon system being acquired and then being hit by the enemy. The percentages in table M-2 are, therefore, predicated on the occurrence of these two events.

Category	Weapon System
M1A2/120	93
M2A3/TOW	83
FSCS/45	83
BSFV-E	83
M3A3/TOW	83
AVENGER	69
MLRS-D	71
CRUSADER-D	49
AH64D	41
RAH66	41
RAH66D	41

Percent Repairable by Weapon
Table M-2

(2) Permanent losses of operational systems can occur in several ways. The most frequent is usually due to catastrophic combat damage. In addition, both types of candidate repairables (combat and reliability) are subject to weapon system abandonment at the maneuver unit or maintenance unit level. Maneuver and maintenance unit abandonment's of weapon systems occur due to immediate war-fight conditions, thus becoming permanent losses like catastrophic kills. Weapon systems can be traveling on an MSR when the scenario ends; thus these weapon systems are not consider part of a combat unit's arsenal. Another key factor which affects availability is the nonavailability of an owning unit. This occurs when a maintenance unit has repaired systems but does not have a maneuver unit in its area of influence with authorization to accept the system. In some cases, such weapons are never reissued during the scenario. Crewed weapon systems' RTC may be delayed because the appropriate number of crew members is not available to operate the weapon system. All five of these factors (catastrophic damage, abandonments, unit non-availability, weapons being reissued, and weapon systems waiting crews) are independent of the CSS system performance. Table M-3 shows the number of systems for each of these categories at the end of the scenario.

Weapon	# Weapons Waiting Units	# Weapons Waiting Crews	# Weapons Being Reissued	Maneuver Unit Abandonments	Catastrophic Kills	Total
M1A2/120	0.0	32.2	0.2	2.4	1.3	36.1
M2A3/TOW	0.0	27.0	0.2	1.1	2.3	30.6
FSCS/45	0.0	8.0	0.0	0.3	0.7	9.0
BSFV-E	0.0	1.0	0.0	0.0	0.0	1.0
M3A3/TOW	0.0	0.0	0.0	0.0	0.0	0.0
AVENGER	0.0	1.6	0.0	0.0	0.4	2.0
MLRS-D	0.0	0.0	0.0	0.0	0.0	0.0
CRUSADER-D	0.0	2.7	0.0	0.0	0.5	3.2
AH64D	0.0	0.9	0.0	0.0	0.1	1.0
RAH66	0.0	0.0	0.0	0.0	0.0	0.0
RAH66D	0.0	0.5	0.0	0.0	0.0	0.5
Total	0.0	73.9	0.4	3.8	5.3	

Weapon System Losses

Table M-3

(3) Reliability failures are based on mean hours between failures (MHBF) for the major subsystems of each weapon. The major subsystems for this study are Automotive, Armament, Helicopter, and Medical. Of course, the subsystems that fail or are damaged vary by weapon systems (e.g., the M1A2/120 is composed of both subsystems, automotive and armament, while only automotive is represented for the heavy equipment transporter (HET)). Each subsystem is serviced by a different mechanic type. In addition, the MHBF can vary by subsystem for each weapon. Helicopters, for this analysis, are serviced by a single type master mechanic although both automotive and armament failures occur for helicopters. In addition, all wounded/DNBI personnel are treated by a single medical type. The availability and performance of trucks used for resupply is addressed in the supply section of the report.

(4) Factors which influence the RTC of weapon systems are recovery, evacuation, and repair (to include medical treatment of personnel and crews) resources. Each of the CSS resources which performs these services is subject to both combat damage and reliability failure, which determine their availability for weapon system processing and treatment of personnel. Recovery and evacuation are performed on a designated priority basis, while repair and treatment are based on a more complex priority system. Further complicating the impact of repair on weapon system RTC are the repair characteristics of individual weapon systems. These characteristics vary by level of repair (i.e., unit, direct support (DS), general support (GS)), and mean time to repair for each type repair (combat, reliability). These characteristics represent a very complex interrelated system which determines the number of operational weapon systems.

c. Analysis. The maintenance analysis is divided into three sections (Support Services Sufficiency, and CSS Workload):

(1) Support Services Sufficiency.

(a) Recovery - Weapons.

With one exception, recovery operations serviced the recovery workload in a timely manner. "Timely manner" is defined as servicing the recovery workload within two TPs for a given maintenance unit. To meet this criterion the recovery workload at the end of one TP must be serviced in the next time period. The reason for this explanation of "timely manner" is to account for the maximum time of 96 minutes it takes for a recovery vehicle to assist in the recovery of a damaged weapon system or vehicle. If a vehicle requires an assisted recovery during the last half of the current TP, that vehicle would not reach the designated maintenance area until the next TP. The two recovery vehicles modeled are the improved recovery vehicle (M88) and a generic recovery vehicle (HMTWRECKER) which represent all other recovery vehicles which are not M88s. Table M-4 provides an overview of both recovery vehicle's status for the scenario where:

Initial Strength (stgn) is the assigned density at the start of the scenario.

End Strength (stgn) is the number operational at the end of the scenario.

End Availability is the percentage of initial strength available less the number destroyed or abandoned at the end of the scenario.

M88				HMTWRECKER			
Unit ID	Initial Stgn	End Stgn	End Availability	Unit ID	Initial Stgn	End Stgn	End Availability
B300002	1	0.9	90	B300002	1	1.0	99
B3000MX	1	0.9	88	B3000LH	1	1.0	100
B3001H2	5	4.5	90	B3000MX	3	3.0	98
B3002H2	5	4.4	89	B3001H2	2	2.0	99
B3003H2	5	4.5	89	B3002H2	2	2.0	99
B3010MX	4	3.4	86	B3003H2	2	2.0	99
B3011MX	7	4.5	65	B30100H	2	2.0	100
B3012MX	7	5.4	77	B3010MX	3	2.9	97
B3013AR	6	4.3	72	B3011MX	2	1.5	74
B3020MX	4	3.4	85	B3012MX	2	2.0	99
B3021MX	7	5.9	84	B3020MX	3	3.0	98
B3022MX	7	5.8	83	B3021MX	2	2.0	99
B3023AR	6	4.3	71	B3022MX	2	2.0	99
B3030AR	4	3.6	91	B3030AR	3	2.8	94
B3031AR	6	5.0	84	B3033MX	2	1.8	91
B3032AR	6	5.2	87	B30A00H	1	1.0	100
B3033MX	7	6.9	98	B30C00H	1	1.0	100

M88 and HMTWRECKER Ending Availables

Table M-4

The "end availability" is a reliable indicator of availability and recovery support throughout the scenario. Table M-5 provides the combined recovery operations for all divisional maintenance units by TP.

TP	1	2	3	4	5	6	7	8
# RECOV.	81.8	99.9	100.0	95.0	91.8	90.3	91.3	94.8
WAITING RECOV.	27.7	30.6	33.7	32.7	33.7	35.1	34.6	37.4
TP	9	10	11	12	13	14	15	
# RECOV.	96.2	96.2	89.2	87.5	94.4	112.0	86.6	
WAITING RECOV.	35.3	34.7	35.9	36.4	49.8	44.5	46.1	

Recovery Operations for All Divisional Maintenance Units

Table M-5

2 Recovery operations for the aviation brigade's HMTWRECKERs are listed in table M-6. As early as TP 3, the number of vehicles which needed to be recovered to this brigade by a HMTWRECKER was too large to be handled by the two HMTWRECKERs at this unit. As many as 16 vehicles (TPs 12 and 13) had to wait for HMTWRECKERs to become available in order to be recovered. Among these vehicles were fifteen 22-ton cargo trucks.

TP	1	2	3	4	5	6	7	8
# RECOV.	6.6	6.9	6.8	6.8	6.8	6.8	6.8	6.8
WAITING RECOV.	5.2	8.5	10.7	11.9	13.3	14.0	14.0	13.5
VEH AVAIL.	100	100	100	100	100	100	100	100
TP	9	10	11	12	13	14	15	
# RECOV.	6.8	6.8	6.8	6.8	6.8	6.8	6.8	
WAITING RECOV.	13.7	14.0	15.2	15.8	15.8	15.1	14.6	
VEH AVAIL.	100	100	100	100	100	100	100	

HMTWRECKER Recovery Operations for the Aviation Brigade
Table M-6

3 Table M-7 lists the recovery workload for all maintenance units by recovery vehicle type.

Maintenance	Recovered by			Maintenance	Recovered by		
Unit	HMTWRECKER	M88	TOTAL	Unit	HMTWRECKER	M88	TOTAL
B300002	1	0	1	B3020MX	72	39	111
B3000LH	0		0	B3021MX	3	13	17
B3000MX	9	0	9	B3022MX	3	14	17
B3001H2	6	5	11	B3023AR		15	15
B3002H2	6	5	11	B3030AR	74	38	112
B3003H2	7	5	11	B3031AR		14	14
B3010OH	102		102	B3032AR		13	13
B3010MX	80	49	129	B3033MX	3	15	19
B3011MX	4	17	21	B30A00H	0		0
B3012MX	3	18	21	B30C00H	0		0
B3013AR		20	20				

Recovery Workload (by M88 and HMTWRECKER)
Table M-7

3 Conclusion:

HMTWRECKER recovery shortfalls existed at the aviation brigade from TP 3 on; two HMTWRECKERs could not handle the workload produced by this scenario.

(b) Recovery - Personnel.

The recovery of injured personnel is implied; therefore, injured personnel do not require a recovery vehicle for transport from the battlefield to a medical facility. This phenomenon negates the possibility of a backlog of injured personnel needing recovery. Hence, personnel RTC will never be impeded by recovery assets.

(c) Evacuation - Weapons.

1 Evacuation support is performed in the scenario by HETs and a generic evacuation vehicle. The purpose of the generic evacuation vehicle is to represent the backhaul capability of other transporters. The analysis focuses on the HETs because they are considered potential constraints on evacuation. All but five of the key weapon systems utilize HETs for evacuation. The exceptions are AH64D, RAH66, RAH66D, AVENGER, and the PATRIOT. Only the performance of HETs is addressed. Weapon system evacuations are performed in a "timely manner" if damaged weapon systems are evacuated to the designated area (corps or division) within two TPs of the sustained damage.

2 Evacuation in this scenario is supported at the division area (unit B3000MX) and at the corps forward area (unit B000000) with 24 and 30 HETs assigned, respectively. Evacuations occur for two reasons:

- designation of maintenance support at higher support levels.

- lengthy clockhour repair times (any vehicle or weapon system that requires more than seven clockhours to repair will be sent to the corps support area (forward) so it will not 'tie up' mechanics at the ORG level with maintenance work that requires a considerable amount of time).

- maintenance overflow (maintenance overflow occurs when the number of hours needed to repair awaiting weapon systems exceeds a maintenance man hour threshold set for a maintenance unit).

3 Across the scenario, a maximum of two percent of the corps area's HETs and eight percent of the division area's HETs were not available at any given TP, all due to RAM damage.

4 There were 190 vehicle and weapon system evacuations to the corps area which required a HET (refer to table M-8). These vehicles and weapon systems included 152 AVLBS, 24 M1A2/120s, 7 M2A3/TOWs, 3 M3A3/TOWs, 2 M577, and 1 M88. All of these vehicles and weapon systems were evacuated to the corps area in a "timely manner."

TP	1	2	3	4	5	6	7	8
# RECOV.	6.7	16.6	19.1	16.7	15.7	15.1	13.2	12.7
WAITING RECOV.	5.9	9.1	12.0	10.6	11.7	10.7	9.8	10.3
TP	9	10	11	12	13	14	15	
# RECOV.	12.9	11.7	11.1	10.7	9.3	9.4	9.1	
WAITING RECOV.	9.6	9.3	9.9	9.4	9.2	9.7	9.5	

Evacuation Workload - Corps Area
Table M-8

5 There were 59 vehicle and weapon system evacuations to the division area which required a HET (refer to table M-9). Of these 59 vehicles and weapon systems, 58 of them were AVLBS. All 59 of these weapon systems were evacuated to the division area in a "timely manner."

TP	1	2	3	4	5	6	7	8
# RECOV.	4.7	5.9	5.4	4.9	4.4	4.1	3.8	3.5
WAITING RECOV.	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6
TP	9	10	11	12	13	14	15	
# RECOV.	3.6	3.2	3.2	3.3	3.0	2.8	3.4	
WAITING RECOV.	0.4	0.5	0.7	0.6	0.5	0.4	0.8	

Evacuation Workload - Division Area
Table M-9

6 Conclusion:

Evacuation is not a constraint on weapon system RTC.

(d) Evacuation - Personnel.

This function was not represented in the VIC model, therefore, no personnel evacuation output data was available for analysis.

(e) Repair - ground based weapons.

1 Sufficient repair support is determined by the availability of required mechanic types at the supporting maintenance facility for ORG/DS and GS levels. For the most part, FORCE XXI mechanics in the DISCOM are modular in that they can repair both ORG and DS level damaged vehicles. Table M-10 shows, for assigned ORG/DS level mechanics, the maximum MMH percentage utilized for each of the 21 maintenance facilities across the scenario. When this percentage is 100, sufficient mechanics were not available to service the workload (note shaded cells) at some point during the scenario.

2 There is one exception to the above described 100 percent indicator - maintenance backlog overflow. Resource status is reported only at the end of a TP thus making it possible that 100 percent utilization occurred within the TP but shows less at the end of the TP due to completion of repairs. So the condition can exist where the ending TP utilization is less than 100 percent but within a TP, conditions existed that caused maintenance backlog overflow.

3 In general, for those facilities with less than 100% utilization at the end of a TP, sufficient maintenance resources were always available. There were only minor exceptions when very small fractional workloads were evacuated due to backlog status and the MMH utilization was not 100%. Any under-utilized resources are not necessarily "excesses" but are indicators of the magnitude of the workload for this scenario. Force structure implications are not addressed in this report.

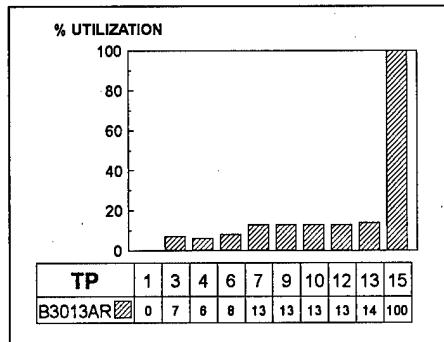
4 Figures M-1 and M-2 show the MMH utilization by mechanic type for those maintenance units with 100 percent utilization.

Unit Name	Armament		Automotive		Helicopter		Medical	
	Util. %	Str.	Util. %	Str.	Util. %	Str.	Util. %	Str.
B300002	2	11	15	21			33	12
B3000LH	0	12	1	22	8	85	50	3
B3000MX	0	19	50	36			74	12
B3001H2	0	23	13	43			53	9
B3002H2	0	23	13	43			54	9
B3003H2	0	23	13	43			53	9
B30100H	0	3	100	6	0	147	64	3
B3010MX	69	29	100	54			100	20
B3011MX	81	18	100	35			25	21
B3012MX	46	18	56	35			23	21
B3013AR	100	21	94	38			70	9
B3020MX	6	29	75	54			46	20
B3021MX	16	18	32	35			19	21
B3022MX	14	18	32	35			19	21
B3023AR	22	21	29	38			40	9
B3030AR	7	29	80	54			45	20
B3031AR	13	21	29	38			40	9
B3032AR	15	21	29	38			40	9
B3033MX	14	18	46	35			21	21
B30A00H	0	12	9	22	6	120	100	3
B30C00H	0	11	4	20	1	98	48	3

Utilization and Initial Strength by ORG/DS Level Mechanics
Table M-10

a Figure M-1 shows the ORG/DS armament mechanic utilization for the FSC supporting the 3rd armored battalion of the 1st brigade (unit B3013AR). This was the only unit within the DISCOM that had any maintenance problems handling the armament

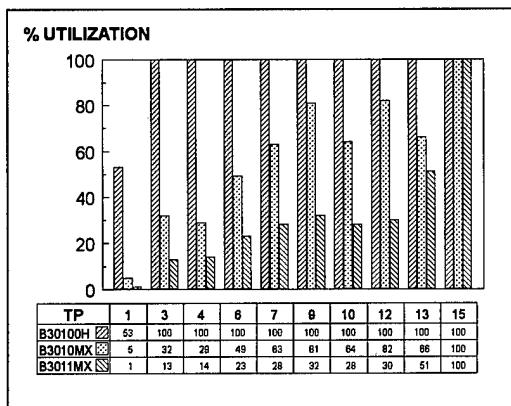
workload produced from this scenario. This FSC's (unit B3013AR) armament mechanics became 100% utilized during TP 15, this is the only TP in which this occurred (see Figure M-1). No maintenance overflow occurred at this maintenance facility, and there were one M1A2/120 and one M2A3/TOW waiting for armament mechanics at the end of this TP (end of the scenario).



ORG/DS Level Armament Mechanic Utilization for the FSC Supporting the 3rd armored battalion of the 1st brigade (Unit B3013AR)

Figure M-1

b Three maintenance facility's ORG/DS level automotive mechanics were 100 percent utilized (see figure M-2): units B30100H, B3010MX, and B3011MX.



ORG/DS Level Automotive Mechanic Utilization for units B30100H, B3010MX, and B3011MX

Figure M-2

- The automotive mechanics in support of the aviation brigade (unit B30100H) was fully utilized from TP 3 on. Twenty 22-ton cargo trucks, one IMTV, one MTV, and one 1-ton cargo truck had to be evacuated to the CSB(DS) because of maintenance overflow, and TP 11 saw the most vehicles waiting for automotive mechanics to become available with ten 22-ton cargo trucks, 1 IMTV, and 1 MTV.

- The automotive mechanics at the 1st brigade's BMC (unit B3010MX) became fully utilized during TP 15. Maintenance overflow occurred with two 22-ton cargo trucks, one 5000 gallon fuel tanker, and 1 MTV having to be evacuated to the CSB(DS) from this BMC. There was a large number of vehicles and weapon systems waiting for automotive repair at the end of TP 15. Some of these systems were 44 1-ton cargo trucks, 6 22-ton cargo trucks, 4 IMTVs, 3 5-ton ammo trucks, 2 5000 gallon fuel tankers, 2 10-ton ammo trucks, 2 AVLs, 2 M1A2/120s, 2 HETs, 1 1800 gallon fuel truck, 1 M88, 1 GRIZZLY, 1 BCMDVEH, and 1 M2A3/TOW.

- The automotive mechanics in support of the 1st brigade's 1st mechanized infantry battalion (unit B3011MX) became fully utilized during TP 15. One M1A2/120, one M2A3/TOW, one MTV, and one BCMDEVH had to be recovered to the 1st brigade's BMC, but there were few vehicles waiting for automotive mechanics to become available at the end of

TP 15. These vehicles were one 1-ton cargo truck and one ambulance.

c Table M-11 shows the GS level mechanic utilization at the CSB(DS).

Unit Name	Armament		Automotive		Helicopter		Medical	
	Util. %	Str.	Util. %	Str.	Util. %	Str.	Util. %	Str.
CSB(DS)	37	102	100	154	5	76	7	300

Utilization and Initial Strength by GS Level Mechanics

Table M-11

- The automotive mechanics at the CSB(DS) were 100 percent utilized from TP 10 on. The largest buildup of unserviced weapon systems occurred during TP 14 with 19 M88s, 9 M2A3/TOWs, 6 MLRS, 5 M1A2s, 4 ENGTRKs, 3 FSCS/45s, 3 CRUSADERs, 3 DOZERs, 2 FARVs, 1 GRIZZLY, 1 GRADER, and 1 M578. So the automotive mechanics at the CSB(DS) had difficulties repairing the workload produce during this scenario.

No maintenance units within the DISCOM constrained key weapon system RTC.

(f) Repair - helicopters.

Note: The AH64D (Apache) and the RAH66D & RAH66 (Comanche) are the systems represented by the helicopter weapon system category.

1 Sufficient helicopter repair support is determined by the availability of required helicopter mechanics at the supporting maintenance facility. The number of helicopter mechanics assigned to the helicopter battalions, the corps area, and division area can be found in tables M-10 through M-11. Note from these tables that none of the helicopter maintenance facilities had their mechanics 100% utilized during any TP of the scenario.

2 Recovery - The AH64D, RAH66, and the RAH66D do not require assisted recovery. If one of these helicopters receives non-catastrophic damage, that helicopter is assumed to self-recover. Helicopter RTC will never be impeded by recovery assets.

3 Evacuation - The AH64D, RAH66, and the RAH66D do not require a HET for evacuation. Instead, a generic evacuation vehicle is used to evacuate AH64Ds and RAH66Ds. The availability of HETs does not hamper the process of helicopter evacuation.

4 Conclusion:

None of the three CSS assets (recovery, evacuation, and repair) restricted helicopter RTC during the scenario.

(g) Medical treatment.

1 Personnel can be in one of the following three categories: combat ready, medical treatment process, or KIA. When injured personnel arrive at a medical facility, they receive treatment immediately, have to wait for the next available medic, or have to be evacuated to a higher echelon because of the severity of the wound. After treatment, injured personnel are returned to their respective unit. Refer to table M-12, the theater's Blue troop force was at 94%, its lowest availability during any TP

of the scenario (the troop force availability at TP 15 was lower than the availability at TP 14 by .13 percentage points).

TP	Combat Ready	Being Treated	KIA	% AVAIL
0	12,863	0	0	100
1	12,819	44	0	100
2	12,755	108	0	99
3	12,773	90	0	99
4	12,786	77	0	99
5	12,722	141	0	99
6	12,743	120	0	99
7	12,762	101	0	99
8	12,698	165	0	99
9	12,714	149	0	99
10	12,720	143	0	99
11	12,656	207	0	98
12	12,632	230	1	98
13	12,333	438	92	97
14	11,870	762	231	94
15	11,831	793	239	94

Theater Personnel Profile

Table M-12

2 During the course of the scenario, the majority of personnel that are not combat ready are being treated or awaiting treatment at the corps area. When injured personnel have to be evacuated to corps, their severe injuries take approximately six days to treat; therefore, those persons will not return to duty for the remaining part of the scenario.

3 While the combined totals of the theater's Blue troop forces always remained above the 80% availability sufficiency criterion, two units (units B3001EN and B3004EN) fell below this criterion for two or more consecutive TPs. These units are listed in table M-13 along with their troop combat availability percentage. The increase of combat intensity in the later part of the scenario and the treatment time of injured troops evacuated to the corps area are the two factors that contribute to the low troop availability at these units.

TP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B3001EN	100	99	99	99	99	99	99	99	99	99	98	100	94	62	62
B3004EN	100	99	99	99	99	99	99	99	99	99	99	98	83	56	55

Percentage of Personnel Available

Table M-13

4 Conclusion:

Medical repair teams organic to echelons lower than division did not constrain personnel RTC.

(2) Key Weapon Availability.

(a) Up to this point the analysis has addressed individual CSS support services (recovery, evacuation, repair, medical treatment) and their impact on RTC. With the exceptions noted, for the most part each of these support services was sufficient for the available workloads.

(b) The following section of the report, in effect, examines the cumulative effects of CSS services by looking at the availability of key weapons. Tables M-14 through M-24 provide unit level overviews for each key weapon system.

- 1 Each table (M-14 through M-24) contains the following information:
 - Initial Strength (stgn) - weapon system density at the start of the scenario.
 - End Strength (stgn) - weapon system density at the end of the scenario.
 - Permanent Losses (K-kills) - catastrophic kills and abandonments.
 - End % availability - weapon system availability at the end of the scenario. This availability calculation excludes permanent losses in conformance with the earlier described sufficiency criteria. Permanent losses are excluded because their occurrence is independent of how well (or poorly) CSS performs.

- 2 Two phenomena appearing in the following tables warrant discussion:

a A "dead unit" is indicated when the "end strength" and "availability" are zero. A "dead unit" occurs when significant unit resources are decimated and that unit can no longer effectively function. Its surviving resources, damaged and undamaged, are distributed to repair or other units requiring weapons, respectively. The row in each table for dead units is shaded.

b One would expect the "end strength" to always be smaller than initial strength if there were permanent losses. This is not always the case because of the need based reissue of repaired (and crewed) weapons. Depending on the current available strength of a weapon, reissues are distributed proportionally higher to those units with the greatest need (lowest current strength) and not to the unit which originally "owned" the weapon.

(c) Results:

1 All weapon systems meet the availability sufficiency criterion (80 percent) except for the following cases:

a The ending availability of the M1A2/120s at the following units was below the 80 percent mark: B3011MX (58 percent), B3012MX (53 percent), B3013AR (61 percent), B3022MX (78 percent), and B3023AR (63 percent).

- Unit B3011MX had five M1A2/120s waiting to be reissued but lacked a sufficient number of crew members in order to do so. When these systems reach their owning unit the availability will be approximately 95 percent.

- There were a couple of reasons why unit B3012MX's M1A2/120s did not maintain a 80 percent availability strength at the end of the scenario. Four of this unit's M1A2/120s sustained combat damage during TP 14 and were not repaired in time to be reissued to this battalion before the scenario ended. Also, this unit had a shortage of M1A2/120 crew members to reissued these systems to the battlefield. Three M1A2/120s were waiting to be reissued at this unit's FSC because of a crew shortage.

- Unit B3013AR's M1A2/120s sustained combat damage late in the scenario (seven systems were damaged during TPs 13 and 14), but only one had not been fully repaired by the end of the scenario. Eight M1A2/120s were waiting for a crew at the end of the scenario.

- Units B3022MX and B3023AR did not have a M1A2/120 shortage as the three already mentioned units. The FSC supporting unit B3022MX had two M1A2/120s that were

combat ready, but could not be returned because of a crew shortage. Unit B3023AR's FSC also had a crew problem and could not reissue five M1A2/120s because of this problem.

b The ending availability of the M2A3/TOWs at the following units was below the 80 percent mark: B3011MX (76 percent), B3012MX (67 percent), B3013AR (66 percent), B3022MX (79 percent), and B3023AR (78 percent).

- Unit B3011MX had five M2A3/TOWs waiting to be reissued but lacked a sufficient number of crew members in order to do so. When these systems reach their owning unit the availability will be approximately 95 percent.

- There were a couple of reasons why unit B3012MX's M2A3/TOWs did not maintain a 80 percent availability strength at the end of the scenario. Six of this unit's M2A3/TOWs sustained combat damage during TP 14 and two of these systems were not repaired in time to be reissued to this battalion before the scenario ended. Also, this unit had a shortage of M2A3/TOW crew members to reissued these systems to the battlefield. Five M2A3/TOWs were waiting to be reissued at this unit's FSC because of a crew shortage.

- Unit B3013AR's M2A3/TOWs sustained combat damage late in the scenario (three systems were damaged during TPs 13 and 14), but only one had not been fully repaired by the end of the scenario. Two M2A3/TOWs were waiting for a crew at the end of the scenario.

- Units B3022MX and B3023AR didn't have as M1A2/120 shortage as the three already mentioned units. The FSC supporting unit B3022MX had four M2A3/TOWs that were combat ready, but could not be returned because of a crew shortage. One other M2A3/TOW was combat damaged during TP 15 and was still being repaired at the end of the scenario. Unit B3023AR's FSC also had a crew problem and could not reissue two M2A3/TOWs because of this problem.

2 No units from the Brigadier Division were rendered combat ineffective during the scenario.

3 Conclusion:

The CSS system did not constrain weapon system availability. The same units that had a M1A2/120 end availability below 80 percent also had a low availability of M2A3/TOWs. This would indicate that these units sustained more combat damage than the other maneuver units. Also, crew shortages were another underlying factor for these system shortages.

Reference (b).1. of Section (2), Key Weapon Availability -- end % availability is the weapon system availability at the end of the scenario. This availability calculation excludes permanent losses in conformance with the earlier described sufficiency criteria. Permanent losses are excluded because their occurrence is independent of how well (or poorly) CSS performs.

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B3011MX	14	7.9	0.3	58
B3012MX	14	7.2	0.5	53
B3013AR	30	18.0	0.7	61
B3021MX	14	11.1	0.1	80
B3022MX	14	10.9	0.1	78
B3023AR	30	17.8	1.8	63
B3031AR	30	24.6	0.1	82
B3032AR	30	24.7	0.2	83
B3033MX	14	13.5	0.0	96
Total Permanent Losses		3.8		

M1A2/120 Status

Table M-14

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B3010MX	3	2.6	0.0	87
B3011MX	30	22.3	0.7	76
B3012MX	30	19.2	1.3	67
B3013AR	14	8.9	0.7	66
B3020MX	3	2.6	0.0	85
B3021MX	30	24.6	0.1	83
B3022MX	30	23.4	0.3	79
B3023AR	14	10.6	0.4	78
B3030AR	3	2.7	0.0	91
B3031AR	14	12.0	0.0	86
B3032AR	14	12.1	0.1	86
B3033MX	30	29.5	0.0	98
Total Permanent Losses		3.6		

M2A3/TOW Status

Table M-15

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B300AAD	8	7.6	0.0	95
B300BAD	8	7.4	0.0	93
B300CAD	8	7.6	0.0	95
Total Permanent Losses			0.0	

BSFV-E Status

Table M-16

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B3010RE	13	11.8	0.5	94
B3011MX	6	4.7	0.1	79
B3012MX	6	4.8	0.1	81
B3013AR	6	5.1	0.1	86
B3020RE	13	12.0	0.0	93
B3021MX	6	5.0	0.0	83
B3022MX	6	4.9	0.0	82
B3023AR	6	4.9	0.0	82
B3030RE	13	10.6	0.2	83
B3031AR	6	5.1	0.0	84
B3032AR	6	5.1	0.0	86
B3033MX	6	5.9	0.0	98
Total Permanent Losses		1.0		

FSCS/45 Status
Table M-17

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B300AAD	2	1.9	0.0	97
B300BAD	2	1.9	0.0	95
B300CAD	2	1.9	0.0	97
Total Permanent Losses			0.0	

M3A3/TOW Status
Table M-18

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B3000FC	3	3.0	0.0	100
B3000LH	2	2.0	0.0	99
B3000MX	3	2.9	0.0	97
B3004EN	4	2.7	0.4	74
B300AAD	6	5.8	0.0	96
B300BAD	6	5.7	0.0	94
B300CAD	6	5.8	0.0	96
B301FSB	2	2.0	0.0	100
B302FSB	2	2.0	0.0	100
B303FSB	2	2.0	0.0	100
B304FSB	2	2.0	0.0	99
B30A00H	2	2.0	0.0	99
B30C00H	2	2.0	0.0	99
Total Permanent Losses			0.4	

AVENGER Status
Table M-19

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B300AM2	9	8.9	0.0	99
Total Permanent Losses			0.0	

MLRS D Status
Table M-20

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B3001H2	18	15.5	0.0	86
B3002H2	18	14.7	0.5	84
B3003H2	18	15.5	0.0	86
Total Permanent Losses			0.5	

CRUSADER-D Status

Table M-21

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B30A00H	15	11.1	0.1	74
Total Permanent Losses			0.1	

AH64D Status

Table M-22

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B3000LH	24	22.9	0.0	95
Total Permanent Losses			0.0	

RAH66 Status

Table M-23

Unit ID	Initial Stgn	End Stgn	K-Kills	End % Avail
B30A00H	9	6.9	0.0	77
Total Permanent Losses			0.0	

RAH66D Status

Table M-24

(3) CSS Workloads. The following CSS workloads are provided to show the type and magnitude of workload serviced by each unit.

(a) Recovery and evacuation vehicle workload. The second and third columns in table M-25 indicate the number of vehicles that required assisted recovery from their owning unit. The fourth through seventh columns show the number of vehicles that required evacuation 'in' and 'out' of a higher echelon maintenance unit. Also, whether or not the vehicle required a HET for evacuation.

Maint Unit	Total # of assisted recoveries		# EVAC'D IN		# EVAC'D OUT	
	HMTWRECKER	M88	TOTAL	w/ HET	TOTAL	w/ HET
B000000	424.9	151.4	224.1	194.1	0.0	0.0
B300002	0.8	0.3	0.0	0.0	0.0	0.0
B3000LH	0.3	0.0	0.0	0.0	0.0	0.0
B3000MX	8.5	0.3	0.0	0.0	54.4	54.4
B3001H2	6.3	4.7	0.0	0.0	0.0	0.0
B3002H2	6.5	4.8	0.0	0.0	0.0	0.0
B3003H2	6.5	4.8	0.0	0.0	0.0	0.0
B30100H	102.1	0.0	0.0	0.0	23.6	0.2
B3010MX	75.2	59.8	0.0	0.0	24.4	20.1
B3011MX	3.7	17.1	0.0	0.0	8.9	2.7
B3012MX	3.2	17.5	0.0	0.0	0.7	0.2
B3013AR	0.0	19.9	0.0	0.0	15.6	7.7
B3020MX	72.0	38.6	0.0	0.0	19.7	19.7
B3021MX	3.2	13.4	0.0	0.0	0.0	0.0
B3022MX	3.1	13.7	0.0	0.0	0.0	0.0
B3023AR	0.0	14.7	0.0	0.0	0.0	0.0
B3030AR	74.4	38.9	1.2	0.5	19.2	19.2
B3031AR	0.0	14.1	0.0	0.0	0.0	0.0
B3032AR	0.0	13.3	0.0	0.0	0.0	0.0
B3033MX	3.5	15.3	0.0	0.0	1.2	0.5
B30A00H	0.4	0.0	0.0	0.0	0.0	0.0
B30C00H	0.4	0.0	0.0	0.0	0.0	0.0

Recovery and Evacuation Workload
Table M-25

(b) Medical team workload. Table M-26 shows the number of personnel that arrived at a medical facility during the scenario due to combat and non-combat (DNBI) actions. The last column displays the number of treatment man hours expended by all medical teams.

MEDICAL UNIT	CBT MEDICAL RECOVERED	DNBI MEDICAL RECOVERED	MMH EXPENDED	MEDICAL UNIT	CBT MEDICAL RECOVERED	DNBI MEDICAL RECOVERED	MMH EXPENDED
B000000	333	364	1,017.1	B3013AR	2	20	46.4
B300002	0	20	44.6	B3020MX	0	48	105.3
B3000LH	0	15	34.0	B3021MX	0	22	49.7
B3000MX	0	50	109.6	B3022MX	0	22	49.7
B3001H2	0	27	59.6	B3023AR	0	20	44.4
B3002H2	0	27	59.7	B3030AR	0	48	105.6
B3003H2	0	27	59.6	B3031AR	0	20	44.5
B30100H	0	19	43.2	B3032AR	0	20	44.5
B3010MX	13	80	190.2	B3033MX	0	22	50.0
B3011MX	1	22	50.6	B30A00H	0	21	36.5
B3012MX	1	22	50.9	B30C00H	0	13	29.7

Medical Unit Workload
Table M-26

(c) Maintenance team workload. Table M-27 shows the number of vehicles (both ground and air) that were recovered to a maintenance facility during the scenario. The last four columns display the number of maintenance man hours expended on ground and air vehicles and the estimated number of maintenance man hours required at TP 15 to repair all vehicles at the maintenance facilities.

MAINT. UNIT	# VEHICLES RECOVERED		GROUND VEHICLES		HELICOPTERS	
	CBT DAMAGE	RAM DAMAGE	MMH EXPENDED	MMH NEEDED	MMH EXPENDED	MMH NEEDED
B300002	0.0	38.6	27.6	0.3		
B3000LH	0.0	42.6	7.0	0.1	104.9	0.8
B3000MX	0.0	88.2	91.4	0.6		
B3001H2	0.0	51.0	45.6	1.4		
B3002H2	0.7	51.3	46.0	2.8		
B3003H2	0.1	51.4	46.0	1.7		
B30100H	0.0	145.6	122.7	14.2	0.0	0.0
B3010MX	106.6	266.7	430.7	271.9		
B3011MX	33.1	58.6	162.4	12.8		
B3012MX	18.3	59.3	142.3	25.1		
B3013AR	35.1	54.7	165.5	7.7		
B3020MX	0.2	219.9	360.4	63.5		
B3021MX	0.2	59.8	124.0	4.8		
B3022MX	1.2	59.9	123.3	8.0		
B3023AR	4.3	56.0	130.7	9.5		
B3030AR	8.5	220.9	362.5	70.8		
B3031AR	0.7	56.3	131.0	10.3		
B3032AR	0.0	56.3	131.2	8.5		
B3033MX	11.0	61.2	129.7	21.3		
B30A00H	0.0	50.5	16.6	0.2	57.9	0.5
B30C00H	0.0	26.9	15.5	0.2	19.2	0.1

Maintenance Unit Workload

Table M-27

(4) Observations

- 1) HMTWRECKER recovery shortfalls existed at the aviation brigade from TP 3 on; two HMTWRECKERs could not handle the workload produced by this scenario.
- 2) The CSS system did not constrain weapon system availability. The same units that had a M1A2/120 end availability below 80 percent also had a low availability of M2A3/TOWs. This would indicate that these units sustained more combat damage than the other maneuver units. Also, crew shortages were another underlying factor for these system shortages.

6. Supply Analysis.

a. This analysis assesses the CSS system's capability to support combat and combat support units for the defined scenario. The CSS units must fill requests for replenishment stockages in a "timely fashion;" failure to do so can be attributed to lack of transporters, lack of stockages, long order-to-delivery times, or a combination of the three.

b. Analysis. This analysis is structured into two parts: supply class III and supply class V.

(1) Supply Class III.

(a) Requirement. For the scenario, the requirement for class III (petroleum) was found by summing the consumption (quantities "used" plus quantities "lost") of all maneuver units (CSS units were excluded from this computation) during each TP. Calculated in "gallons (gals)," the requirement for class III for the length of the scenario is presented in table L-1.

The consumption of supplies generates a requirement for stocks of supply types as well as transportation assets to deliver the replenishments to maneuver unit stockages. Consumption is translated into an order for materiel. Each order levies upon the CSS system a requirement for existing stocks and transportation assets. The authorized amount declines with time due to the attrition of weapon systems. Each weapon system has an authorized amount of specific supply types, and the authorized stockage is reduced as systems are killed. Table L-1 & Table L-1a identify the area of operation (AO) stockage levels and activities for class III: 1) amounts used; 2) amounts lost; and 3) amounts consumed (the requirement) for the BRIGADIST and the CORPS respectively.

TP	USED GALS	LOST GALS	REQUIREMENT CONSUMED
0	0	0	0
1	7,620	0	7,620
2	4,256	0	4,256
3	5,205	0	5,205
4	3,954	0	3,954
5	5,409	0	5,409
6	11,637	0	11,637
7	9,977	0	9,977
8	9,748	0	9,748
9	14,059	0	14,059
10	16,442	0	16,442
11	31,416	4	31,419
12	30,217	24	30,241
13	31,306	659	31,965
14	34,589	2,807	37,396
15	25,648	1,071	26,719
TOTAL	241,481	4,564	246,045

Consumption of Class III (BRIGADIST), GALS
Table L-1

TP	USED GALS	LOST GALS	REQUIREMENT CONSUMED
0	0	0	0
1	37,260	730	37,990
2	64,900	883	65,783
3	22,788	540	23,328
4	42,618	231	42,849
5	29,049	0	29,049
6	50,107	81	50,188
7	20,236	80	20,317
8	36,041	600	36,641
9	13,727	154	13,881
10	70,981	80	71,061
11	39,406	365	39,770
12	33,031	353	33,384
13	47,276	520	47,796
14	40,707	267	40,974
15	11,622	481	12,104
TOTAL	559,748	5,365	565,113

Consumption of Class III (CORPS), GALS
Table L-1a

(b) Discussion. The resupply options for maneuver units are: 1) resupply is unnecessary (Balance on Hand \geq 75% of Authorized); 2) standard resupply (Balance on Hand \geq 50% & $<$ 75% of Authorized); or 3) emergency resupply (Balance on Hand $<$ 50% of Authorized); reference Appendix B for definitions of "standard" and "emergency" resupply. Table L-2 & Table L-2a indicate during which TP any maneuver unit had a BOH so low as to warrant the use of either standard or emergency resupply.

RESUPPLY	TP															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RESUPPLY UNNEC	35	35	35	35	35	35	35	34	34	32	32	27	21	19	25	27
STANDARD RESUPPLY	0	0	0	0	0	0	0	1	1	3	3	8	14	15	9	7
EMERGENCY RESUPPLY	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
ALL UNITS ¹	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35

¹ COMBAT INEFFECTIVE (DEAD) UNITS ARE NOT INCLUDED.

Number of Maneuver Units Needing Resupply (BRIGADIST), Class III
Table L-2

RESUPPLY	TP															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RESUPPLY UNNEC	45	45	44	43	42	40	41	41	40	39	39	37	36	36	37	36
STANDARD RESUPPLY	0	0	1	2	3	5	3	2	3	2	2	6	7	5	5	5
EMERGENCY RESUPPLY	0	0	0	0	0	0	1	2	2	3	3	1	1	3	2	2
ALL UNITS ¹	45	45	45	45	45	45	45	45	45	44	44	44	44	44	44	43

¹ COMBAT INEFFECTIVE (DEAD) UNITS ARE NOT INCLUDED.

Number of Maneuver Units Needing Resupply (CORPS), Class III
Table L-2a

For more detail on the individual unit(s) requiring resupply see table L-3 & table L-3a below. For the BRIGADIST (Table L-3) the unit waits an average of 1 TP (median of 3 TPs) before its BOH returns to a level no longer requiring resupply of class III. For the CORPS (Table L-3a) these units wait an average of 3.33 TPs (median

of 1.5 TPs) before their BOH returns to a level no longer requiring resupply of class III.

Unit	TP															#TPs	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
B30A00H														39	29	49	3
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	

Percentage of Balance On-Hand (%) for Maneuver Units
Requiring Resupply (BRIGADIST), Class III
Table L-3

For example for the BRIGADIST (Table L-3), at the end of TP 13, B30A00H had a class III BOH of 39%. This was one of three TPs in which B30A00H could have asked for resupply. During TP 13, B3001DC was the only unit capable of requesting resupply.

Unit	TP															#TPs	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
B0000000								44	35	28	22			48	39	28	7
B000CFC																46	1
B00A00H							46		47	43	36	23	24	13	2		8
B00E00H										47							1
B00FO0H														30			1
B00GO0H								46		47							2
TOTAL	0	0	0	0	0	0	1	2	2	3	3	1	1	3	2	2	20

Percentage of Balance On-Hand (%) for Maneuver Units
Requiring Resupply (CORPS), Class III
Table L-3a

For example for the CORPS (Table L-3a), at the end of TP 10, B00E00H had a class III BOH of 47%. This was the only TP in which B00E00H could have asked for resupply. During TP 10, B00E00H was one of 3 units capable of requesting resupply.

(c) Problems. Table L-3 & Table L-3a shows BOH percentage for individual maneuver units requiring resupply. However, a review of individual orders revealed a problem with the availability of transporters for both the BRIGADIST and the CORPS (reference Tables L-4 & L-4a respectively).

TP	REQUESTING UNIT	SUPPLY UNIT	SUPPLY TYPE	AMOUNT REQUESTED GALS	AMOUNT SHIPPED GALS	AMOUNT SHORTED (%)	TRUCKS AVAIL	AVAIL STOCKS GALS
9	B3000MX	B3000FC	POL-B	2,766.56	2,387.78	13.69	0	118875.4
14	B3000MX	B3000FC	POL-B	2,705.16	210.57	92.22	0	115387.8
14	B3000MX	B3000FC	POL-B	2,751.85	518.76	81.15	0	115387.8
15	B300AM2	B3000FC	POL-B	569.6	534.83	6.1	0	114852.9
	TOTAL			8,793.17	3,651.94	58.47		

Problems Filling Maneuver Unit Orders (BRIGADIST), Class III
Table L-4

TP	REQUESTING UNIT	SUPPLY UNIT	SUPPLY TYPE	AMOUNT REQUESTED GALS	AMOUNT SHIPPED GALS	AMOUNT SHORTED (%)	TRUCKS AVAIL	AVAIL STOCKS GALS
2	B00A00H	B001CSA	POL-BACFT	93,814.31	42,284.31	54.93	0	1157715.7
3	B000000	B02RCSB	POL-BACFT	9,782.84	1,184.83	87.89	0	115815.2
4	B000CFC	B00RCSB	POL-BACFT	9,493.46	1,178.8	87.58	0	114623.7
4	B000CFC	B00RCSB	POL-BACFT	9,039.34	0	100	0	114623.7
4	B00A00H	B001CSA	POL-BACFT	84,016.45	23.06	99.97	0	1157663.1
4	B000CFC	B00RCSB	POL-BACFT	9,779.22	1,175.79	87.98	0	114623.7
4	B000CFC	B00RCSB	POL-BACFT	9,332.23	21.75	99.77	0	114623.7
4	B000000	B02RCSB	POL-BACFT	12,316.75	12.97	99.89	0	115802.2
5	B000CFC	B00RCSB	POL-BACFT	10,012.12	1,172.8	88.29	0	112237.8
5	B000000	B02RCSB	POL-BACFT	13,041.22	1,180.3	90.95	0	114621.9
5	B000CFC	B00RCSB	POL-BACFT	9,560.33	21.66	99.77	0	112237.8
5	B000CFC	B00RCSB	POL-BACFT	10,257.55	1,169.81	88.6	0	112237.8
5	B000CFC	B00RCSB	POL-BACFT	9,823.69	21.58	99.78	0	112237.8
6	B000CFC	B00RCSB	POL-BACFT	10,501.55	1,166.82	88.89	0	109840.4
6	B000000	B02RCSB	POL-BACFT	14,882.89	12.92	99.91	0	113422.9
6	B00A00H	B001CSA	POL-BACFT	93,602.74	23.06	99.98	0	1100943.1
6	B000CFC	B00RCSB	POL-BACFT	10,068.96	32.69	99.68	0	109840.4
6	B000000	B02RCSB	POL-BACFT	16,653.54	1,186.09	92.88	0	113422.9
6	B000CFC	B00RCSB	POL-BACFT	10,735.02	1,165.34	89.14	0	109840.4
6	B000000	B02RCSB	POL-BACFT	16,213.35	0	100	0	113422.9
6	B000CFC	B00RCSB	POL-BACFT	10,292.45	32.61	99.68	0	109840.4
7	B000CFC	B00RCSB	POL-BACFT	10,998.77	1,163.85	89.42	0	107445.4
7	B000CFC	B00RCSB	POL-BACFT	10,573.81	32.52	99.69	0	107445.4
7	B000CFC	B00RCSB	POL-BACFT	11,258.52	1,162.37	89.68	0	107445.4
7	B000000	B02RCSB	POL-BACFT	19,264.63	12.88	99.93	0	112223.5
7	B000CFC	B00RCSB	POL-BACFT	10,829.14	36.23	99.67	0	107445.4
7	B000000	B02RCSB	POL-BACFT	20,814.29	1,186.52	94.3	0	112223.5
7	B00A00H	B001CSA	POL-BACFT	99,792.33	1.47	100	0	1048329.1
8	B000CFC	B00RCSB	POL-BACFT	11,509.04	1,160.88	89.91	0	105052.9
8	B000000	B02RCSB	POL-BACFT	20,368.33	0	100	0	112223.5
8	B00A00H	B001CSA	POL-BACFT	1.01	0	100	0	1041995.1
8	B000CFC	B00RCSB	POL-BACFT	11,075.29	36.14	99.67	0	105052.9
8	B000CFC	B00RCSB	POL-BACFT	11,763.38	1,159.4	90.14	0	105052.9
8	B000CFC	B00RCSB	POL-BACFT	11,325.31	36.05	99.68	0	105052.9
9	B000CFC	B00RCSB	POL-BACFT	12,007.71	1,157.92	90.36	0	102656.9
9	B000000	B02RCSB	POL-BACFT	23,265.17	12.85	99.94	0	111023.8
9	B000CFC	B00RCSB	POL-BACFT	11,565.36	41.63	99.64	0	102656.9
9	B000000	B02RCSB	POL-BACFT	24,932.02	1,186.81	95.24	0	111023.8
9	B000CFC	B00RCSB	POL-BACFT	12,233.86	1,154.97	90.56	0	102656.9
9	B000000	B02RCSB	POL-BACFT	24,515.71	0	100	0	111023.8
9	B00A00H	B001CSA	POL-BACFT	1.01	0	100	0	1029489.3
9	B000CFC	B00RCSB	POL-BACFT	11,788.75	41.47	99.65	0	102656.9
10	B000CFC	B00RCSB	POL-BACFT	12,454.29	1,152.03	90.75	0	100266
10	B00B00H	B001CSA	POL-BACFT	40,204.45	17,155.06	57.33	0	970102.7
10	B000CFC	B00RCSB	POL-BACFT	12,006.46	41.31	99.66	0	100266
10	B000000	B02RCSB	POL-BACFT	26,828.89	12.8	99.95	0	90103.8
10	B00A00H	B001CSA	POL-BACFT	1.01	0	100	0	970102.7

TP	REQUESTING UNIT	SUPPLY UNIT	SUPPLY TYPE	AMOUNT REQUESTED GALS	AMOUNT SHIPPED GALS	AMOUNT SHORTED (%)	TRUCKS AVAIL	AVAIL STOCKS GALS
10	B000CFC	B00RCSB	POL-BACFT	12,666.52	1,149.09	90.93	0	100226
10	B000000	B02RCSB	POL-BACFT	27,498.08	1,182.27	95.7	0	90103.8
10	B000CFC	B00RCSB	POL-BACFT	12,215.99	48.51	99.6	0	100266
10	B000000	B02RCSB	POL-BACFT	8,193.53	4.2	99.95	0	90103.8
10	B00AO0H	B001CSA	POL-BACFT	2.01	1.45	27.86	0	970102.7
11	B000CFC	B00RCSB	POL-BACFT	12,863.25	1,146.16	91.09	0	97880.1
11	B000CFC	B00RCSB	POL-BACFT	12,410.08	48.33	99.61	0	97880.1
11	B000CFC	B00RCSB	POL-BACFT	13,051.97	1,143.24	91.24	0	97880.1
11	B00AO0H	B001CSA	POL-BACFT	2.01	1.66	17.41	0	796275.9
11	B000CFC	B00RCSB	POL-BACFT	12,586.24	48.14	99.62	0	97880.1
11	B00AO0H	B001CSA	POL-BACFT	33,212.96	0	100	0	796275.9
12	B000CFC	B00RCSB	POL-BACFT	13,222.81	1,140.32	91.38	0	95482.6
12	B000CFC	B00RCSB	POL-BACFT	12,764.45	59.27	99.54	0	95482.6
12	B000CFC	B00RCSB	POL-BACFT	13,384.42	1,138.87	91.49	0	95482.6
12	B000CFC	B00RCSB	POL-BACFT	12,922.07	59.12	99.54	0	95482.6
13	B000CFC	B00RCSB	POL-BACFT	13,536.77	1,137.42	91.6	0	93087.4
13	B000CFC	B00RCSB	POL-BACFT	13,070.48	58.97	99.55	0	93087.4
13	B000CFC	B00RCSB	POL-BACFT	13,679.95	1,135.97	91.7	0	93087.4
13	B000CFC	B00RCSB	POL-BACFT	13,209.75	62.77	99.52	0	93087.4
13	B00FO0H	B001CSA	POL-B	7,326.86	3,365.2	54.07	0	1183316.1
14	B000CFC	B00RCSB	POL-BACFT	13,810.08	1,134.52	91.78	0	90694.8
14	B000CFC	B00RCSB	POL-BACFT	13,336	62.61	99.53	0	90694.8
14	B000CFC	B00RCSB	POL-BACFT	13,931.2	1,133.07	91.87	0	90694.8
14	B000CFC	B00RCSB	POL-BACFT	13,443.81	62.45	99.54	0	90694.8
15	B000CFC	B00RCSB	POL-B	8,147.07	1,131.62	86.11	0	89430.1
15	B000CFC	B00RCSB	POL-BACFT	14,033.91	0	100	0	89430.1
15	B000CFC	B00RCSB	POL-BACFT	14,683.85	68.09	99.54	0	89430.1
15	B000000	B02RCSB	POL-B	8,451	1,196.93	85.84	0	80748.5
15	B000CFC	B00RCSB	POL-BACFT	15,263.1	1,128.74	92.6	0	89430.1
15	B00BO0H	B001CSA	POL-BACFT	39,497.42	17,090.6	56.73	0	978852.5
15	B000CFC	B00RCSB	POL-BACFT	14,779.12	67.83	99.54	0	89430.1
	TOTAL			1,361,795.31	117,019.77	91.41		

Problems Filling Maneuver Unit Orders (CORPS), Class III
Table L-4a

To quantify a measure of risk, the maximum consumption of class III by a unit for any TP is compared with the current BOH for each TP; if the value is less than one, the unit would exhaust its supplies prior to repeating the activities of this "maximum" TP. Where "at risk" is less than one TP of supply, class III was generally provided to maneuver units without placing them "at risk". No maneuver unit was "at risk" for the BRIGADIST and two maneuver units were "at risk" for the CORPS (reference table L-5a).

MANEUVER UNIT	TP															# of TPs	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
B00AO0H															1	1	2
B00FO0H	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16

"At Risk" Units (CORPS), Class III Risk
Table L-5a

(d) Observation.

Problems filling maneuver unit CSS support Class III orders (both BRIGADIST and CORPS) were due to lack of available transporters.

(2) Supply Class V.

(a) Requirement. For the scenario, the requirement for class V (ammunition) was found by summing the consumption (quantities "used" plus quantities "lost") of all maneuver units (CSS units were excluded from this computation) during each of the 4-hour TPs. Calculated in "short tons (stons)," the requirement for class V for the length of the scenario is presented in table L-6 (BRIGADIST) & table L-6a (CORPS).

TP	USED STONS	LOST STONS	REQUIREMENT CONSUMED
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	171	0	172
12	40	0	40
13	424	4	427
14	418	8	426
15	350	9	359
TOTAL	1,403	21	1,423

Consumption of Class V (BRIGADIST), STONS
Table L-6

TP	USED STONS	LOST STONS	REQUIREMENT CONSUMED
0	0	0	0
1	1,238	19	1,256
2	1,259	23	1,282
3	198	8	206
4	459	2	461
5	192	0	192
6	443	1	445
7	522	1	523
8	456	11	467
9	477	5	482
10	560	1	562
11	624	11	634
12	217	12	229
13	1,020	14	1,034
14	1,013	7	1,020
15	289	10	299
TOTAL	8,967	125	9,092

Consumption of Class V (CORPS), STONS
Table L-6a

(b) Discussion.

1) This analysis focuses on eleven munition types {155MM, MLRS, Hellfire, Longbow, 2.75RKT, Stinger, 120MM, 25MM, Javelin, LAW, and TOWII} using five indices {Amount Authorized, Amount On-Hand, Amount Used, Amount Lost, and Ratio of Amount On-Hand to Amount Authorized} for the BRIGADIST (reference table 7). Also this analysis focuses on ten munition types {155MM, ATACMS, MLRS, Hellfire, Longbow, 2.75RKT, Patriot, Stinger, 40MM, and LAW} using five indices {Amount Authorized, Amount On-Hand, Amount Used, Amount Lost, and Ratio of Amount On-Hand to Amount Authorized} for the CORPS (reference table 7a). A list of all corps and division assets listing VIC unit name designators and their actual unit names is contained in Appendix A. A list of all supply analysis definitions is contained in Appendix B.

a) The aforementioned munition types were grouped into six functional categories (Field Artillery, Aviation, Air Defense Artillery, Armor & Mechanized Infantry, Anti-Armor, and Anti-Tank). Each of the functional categories was divided into subcategories displayed in table L-7 and table L-7a:

Category	Member Munition Type
Field Artillery	155MM - {M107(CB), M116B1, M121A1, M449A1, M483A1, M549A1, M692+M731, M795, M825, M864, M864/AR, M864/GM, XM898, XM898/AR, XM898/GM, XM982, XM982/GM} MLRS - {ER-MLRS, ER-MLRS/GUIDED, M26, MSTAR}
Aviation	HELLFIRE, LONGBOW, 2.75RKT
Air Defense Artillery (ADA)	STINGER
Armor & Mechanized Infantry	120MM - {120MM, PGMM, M929, M933}
Anti-Armor	25MM - {25MM, 40MM, 45MM}
Anti-Tank	JAVELIN, LAW, TOWII

Key Functional Categories (BRIGADIST)
Table L-7

Category	Member Munition Type
Field Artillery	155MM - {M107(CB), M116B1, M121A1, M449A1, M483A1, M549A1, M692+M731, M795, M825, M864, M864/AR, M864/GM, XM898, XM898/AR, XM898/GM, XM982, XM982/GM} ATACMS - {ATACMS_I, ATACMS_IA, ATACMS_II, ATACMS_IIA} MLRS - {ER-MLRS, ER-MLRS/GUIDED, M26, MSTAR}
Aviation	HELLFIRE, LONGBOW, 2.75RKT
Air Defense Artillery (ADA)	PATRIOT, STINGER
Anti-Armor	40MM
Anti-Tank	LAW

Key Functional Categories (CORPS)
Table L-7a

b) Table L-8 and Table L-8a display the key munition types with the five aforementioned indices for each key munition at the end of the scenario. **The scenario end states shown are reliable indicators of individual unit supply status over the course of the scenario:**

c) Table L-8 represents an aggregation by munition type for all units in the BDID-0. Table L-8a represents an aggregation by munition type for all units in the CORPS. However, supply performance at some individual units for specific munitions varied significantly from these general indicators.

- The first column, key munition type, lists each of the munition types included for analysis in this report.

- The second column, amount authorized indicates quantities at initial state (TP 0) of the scenario.

- The total amount used of a key munition type (column three) can exceed the endstate BOH because during a particular TP a unit can receive a key munition type.

- Munitions lost due to combat activity (column four) did not cause any significant inventory imbalances resulting in availability shortfalls.

- The fifth and sixth columns, amount authorized and balance on hand (BOH) respectively, indicate quantities at endstate (TP 15) of the scenario.

- The seventh column, percentage of balance on hand of amount authorized, indicates that at endstate (TP 15) of the scenario, the quantity of munitions available for mission support was large and more than sufficient to meet requirements. **The Balance on Hand was at least one hundred percent of authorized for each munition type except 155MM, LONGBOW, MLRS, and JAVELIN for the BRIGADIST; 155MM, ATACMS, MLRS, and LONGBOW for the CORPS.**

Key Munition Type	Initial State	Consumption		Endstate		
		Amt Authorized (Rounds) @ TP0	Total Amount Used (Rounds)	Total Amount Lost (Rounds)	Amt Authorized (Rounds) @ TP15	BOH @ TP15 (Rounds)
155MM	25,704	11,722	74	23,147	17,684	76%
MLRS	540	1,127	0	537	191	36%
HELLFIRE	2,106	0	0	1,853	2,106	114%
LONGBOW	2,106	77	0	2,699	1,915	71%
2.75RKT	10,944	491	0	13,908	14,305	103%
STINGER	722	0	2	759	972	128%
120MM	11,704	3,958	108	8,878	19,703	222%
25MM	327,000	3,095	6,693	272,803	555,112	203%
JAVELIN	1,134	125	11	1,038	998	96%
LAW	1,142	19	1	1,104	2,264	205%
TOWII	2,652	228	17	2,117	4,988	236%

Key Munition Status (BRIGADIST)

Table L-8

Key Munition Type	Initial State	Consumption		Endstate		
		Amt Authorized (Rounds) @ TP0	Total Amount Used (Rounds)	Total Amount Lost (Rounds)	Amt Authorized (Rounds) @ TP15	BOH @ TP15 (Rounds)
155MM	33,858	47,283	1,305	20,469	16,803	82%
ATACMS	432	57	0	426	375	88%
MLRS	11,664	17,593	81	6,780	4,067	60%
HELLFIRE	3,294	0	0	2,825	3,294	117%
LONGBOW	3,294	426	0	2,825	2,785	99%
2.75RKT	16,416	1,830	1	14,080	19,055	135%
PATRIOT	128	0	0	116	128	110%
STINGER	942	0	4	831	1,895	228%
40MM	6,960	0	0	6,850	13,920	203%
LAW	350	8	2	319	660	207%

Key Munition Status (CORPS)

Table L-8a

d) Table L-9 & Table L-9a provide an overall summary of the additional supply indicators which help assess the sufficiency of munition availability. Although the indicators are shown by munition type, the individual indicators represent the presence (Yes) or absence (No) of that indicator for some specific unit(s) in the force at the end of a specific TP. Tables L-10 thru L-19 and Tables L-10a thru L-19a provide more detailed analyses of the aforementioned munition availability criteria for the BRIGADIST and CORPS, respectively.

Key Munition Type	BOH (>=75%)	Standard Replenishment BOH (50%-74%)	Emergency Replenishment BOH (1%-49%)	BOH (=0)
155MM	Yes	Yes	Yes	Yes
MLRS	Yes	Yes	Yes	Yes
HELLFIRE	Yes	No	No	No
LONGBOW	Yes	Yes	No	No
2.75RKT	Yes	Yes	No	No
STINGER	Yes	Yes	No	No
120MM	Yes	No	Yes	No
25MM	Yes	No	No	No
JAVELIN	Yes	No	No	No
LAW	Yes	No	No	No
TOWII	Yes	No	No	No

Balance on Hand Status (BRIGADIST)

Table L-9

Key Munition Type	BOH (>=75%)	Standard Replenishment BOH (50%-74%)	Emergency Replenishment BOH (1%-49%)	BOH (=0)
155MM	Yes	Yes	Yes	Yes
ATACMS	Yes	No	No	No
MLRS	Yes	Yes	Yes	Yes
HELLFIRE	Yes	No	No	No
LONGBOW	Yes	Yes	Yes	No
2.75RKT	Yes	Yes	Yes	No
PATRIOT	Yes	No	No	No
STINGER	Yes	Yes	Yes	No
40MM	Yes	No	No	No
LAW	Yes	No	No	No

Balance on Hand Status (CORPS)

Table L-9a

- Balance on Hand (>=75%) of Authorized: Initially all units start in this range since the amount authorized is equal to the balance on hand. BOHs which remain in this range maintain a sufficient quantity of authorized munitions and at no time throughout the scenario require supply replenishment.

- Balance on Hand (50%-74%) of Authorized: This column indicates whether or not the BOH by munition type at any unit fell to the indicated percentage range of the authorized amount. BOH in this range triggers "standard supply replenishment" requests.

-- For six of the munition types in the BRIGADIST (HELLFIRE, 120MM, 25MM, JAVELIN, LAW, and TOWII) no standard supply replenishment was required at any time during the scenario. No HELLFIRE or STINGER munition type was expended during this scenario. Also, no MLRS, HELLFIRE, LONGBOW, or 2.75RKT munition type was lost due to attrition of systems.

-- The other five munition types in the BRIGADIST (155MM, MLRS, LONGBOW, 2.75RKT, and STINGER) triggered standard resupply orders at some specific unit for the BRIGADIST. Tables L-10 through L-14 identify the unit, the time period, and the sub-munition(s) which triggered a standard resupply order.

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
1ST BN 3D FA (155 SP)	55%	TP 12	M864
	73%	TP 12	XM982
	69%	TP 14	XM898
	71%	TP 15	XM898
2ND BN 3D FA (155 SP)	74%	TP 11	M107(CB)
	53%	TP 11	M795
	63%	TP 14	M107(CB)
	66%	TP 15	M107(CB)
3RD BN 3D FA (155 SP)	74%	TP 13	XM982

155MM Standard Replenishment (BRIGADIST)
Table L-10

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
A BTRY 3D FA (MLRS)	68%	TP 11	M26

MLRS Standard Replenishment (BRIGADIST)
Table-11

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
1ST ATK BN 3D AVN	50%	TP 13	LONGBOW
	53%	TP 14	LONGBOW
	54%	TP 15	LONGBOW

LONGBOW Standard Replenishment (BRIGADIST)
Table L-12

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
1ST ATK BN 3D AVN	67%	TP 13	2.75RKT

2.75RKT Standard Replenishment (BRIGADIST)
Table-13

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
1ST ATK BN 3D AVN	63%	TP 13	STINGER

STINGER Standard Replenishment (BRIGADIST)
Table-14

-- For five of the munition types in the CORPS (ATACMS, HELLFIRE, PATRIOT, 40MM, and LAW) no standard supply replenishment was required at any time during the scenario. No HELLFIRE, PATRIOT, STINGER, or 40MM munition type was expended during this scenario. Also, no ATACMS, HELLFIRE, LONGBOW, PATRIOT or 40MM munition type was lost due to attrition of systems.

-- The other five munition types in the CORPS (155MM, MLRS, LONGBOW, 2.75RKT, and STINGER) triggered standard resupply orders at some specific unit. Tables L-10a through L-14a identify the unit, the time period, and the sub-munition(s) which triggered a standard resupply order.

Unit Name	BOH (50% - 74%)	Time Period (TP)	Sub-munition
3RD BN 63TH FA BDE (155 SP)	69% 69% 57% 52% 54% 55% 62% 67% 60% 56% 68% 65% 68% 63% 69%	TP 1 TP 1 TP 1 TP 2 TP 3 TP 4, 5, 6 TP 4 TP 5 TP 7 TP 8 TP 12 & 13 TP 12 TP 14 TP 14 TP 15	M549A1 XM898 XM982 M483A1 M449A1 M449A1 XM898 M483A1 M864 M795 M449A1 M864 M795 XM898 M795
4TH BN 63TH FA BDE (155 SP)	66% 52% 56% 60% 56% 56% 57% 53% 74% 56%	TP 2 TP 2 TP 3, 4, 5 TP 3 TP 3 TP 4 TP 6 TP 6 TP 7 TP 9	M483A1 XM898 M449A1 M483A1 XM898 M449A1 M449A1 M483A1 M483A1 M864
3RD BN 65TH FA BDE (MLRS)	74% 68% 73% 67% 72% 73% 58% 59% 50% 61% 62%	TP 2 TP 3 TP 5 TP 6 TP 7 TP 12 TP 12 TP 13 TP 14 TP 14 TP 15	M483A1 M483A1 M483A1 M483A1 M483A1 M449A1 M483A1 M795 M449A1 M549A1 M549A1
A BTRY 1ST BN 67TH FA BDE (155 T)	64% 68%	TP 14 TP 15	M107 (CB) M107 (CB)
B BTRY 1ST BN 67TH FA BDE (155 T)	53% 56%	TP 14 TP 15	M107 (CB) M107 (CB)
C BTRY 1ST BN 67TH FA BDE (155 T)	53% 64%	TP 12 TP 15	M107 (CB) M107 (CB)
B BTRY 2ND BN 67TH FA BDE (155 T)	67%	TP 11	M107 (CB)

155MM Standard Replenishment (CORPS)
Table L-10a

Unit Name	BOH (50% - 74%)	Time Period (TP)	Sub-munition
1ST BN 63TH FA BDE (MLRS)	60% 57% 61% 62% 58%	TP 2 TP 2 TP 3 TP 4 TP 13	ER-MLRS M26 ER-MLRS ER-MLRS M26
2ND BN 63TH FA BDE (MLRS)	72% 64% 73% 65% 74% 66% 75% 67% 71%	TP 2 & 3 TP 2 & 3 TP 4 TP 4 TP 5 TP 5 TP 6 TP 6 TP 13	ER-MLRS M26 ER-MLRS M26 ER-MLRS M26 ER-MLRS M26 ER-MLRS

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
1ST BN 65TH FA BDE (MLRS)	66%	TP 1	M26
	72%	TP 1	MSTAR
	70%	TP 2	MSTAR
	71%	TP 3	MSTAR
	74%	TP 4	ER-MLRS
	72%	TP 4	MSTAR
	57%	TP 6	M26
	58%	TP 7	M26
	57%	TP 13	ER-MLRS
	65%	TP 14 & 15	ER-MLRS
2ND BN 65TH FA BDE (MLRS)	71%	TP 1	M26
	64%	TP 5	M26
	73%	TP 10	M26
	72%	TP 13	ER-MLRS
	60%	TP 14 & 15	M26
2ND BN 69TH FA BDE (MLRS)	58%	TP 1 & 3	M26
	71%	TP 2	ER-MLRS
	66%	TP 4	ER-MLRS
	74%	TP 5	M26
	55%	TP 8	M26
	67%	TP 9	M26
3RD BN 69TH FA BDE (MLRS)	67%	TP 4	ER-MLRS
	58%	TP 6	ER-MLRS
	75%	TP 8	M26

MLRS Standard Replenishment (CORPS)
Table-11a

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
B00E00H: 1ST BN 102ND ATK HEL RGT	56%	TP 2	LONGBOW
B00FO0H: 2ND BN 102ND ATK HEL RGT	58%	TP 10	LONGBOW
	51%	TP 11	LONGBOW
	52%	TP 13	LONGBOW
B00G00H: 3RD BN 102ND ATK HEL RGT	55%	TP 2	LONGBOW

LONGBOW Standard Replenishment (CORPS)
Table L-12a

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
2ND BN 102ND ATK HEL RGT	58%	TP 10	2.75RKT
3RD BN 102ND ATK HEL RGT	71%	TP 7	2.75RKT

2.75RKT Standard Replenishment (CORPS)
Table-13a

Unit Name	BOH(50%-74%)	Time Period(TP)	Sub-munition
1ST BN 102ND ATK HEL RGT	58%	TP 2	STINGER
2ND BN 102ND ATK HEL RGT	53%	TP 10	STINGER
3RD BN 102ND ATK HEL RGT	58%	TP 2	STINGER

STINGER Standard Replenishment (CORPS)
Table-14a

- Balance on Hand (1%-49%) of Authorized: This column indicates whether or not the BOH by munition type at any unit fell to the indicated percentage range of the authorized amount. BOH in this range triggers "emergency supply replenishment" requests. Three of the munition types (155MM, MLRS, and 120MM) required emergency resupply for the BRIGADIST. Tables L-15 through L-17 depict specific unit, time period, and sub-munition type which generate an emergency resupply request.

Unit Name	BOH (1%-49%)	Time Period (TP)	Sub-munition
1ST BN 3D FA (155 SP)	34%	TP 13	M483A1
	33%	TP 13	M795
	20%	TP 14	M483A1
	21%	TP 15	M483A1
2ND BN 3RD FA (155 SP)	30%	TP 13	M795
	41%	TP 13	XM982
	49%	TP 14	M449A1
	41%	TP 14	M795
	43%	TP 15	M795

155MM Emergency Replenishment (BRIGADIST)

Table L-15

Unit Name	BOH (1%-49%)	Time Period (TP)	Sub-munition
A BTRY 3D FA (MLRS)	38%	TP 13	ER-MLRS
	47%	TP 13	M26
	44%	TP 14	ER-MLRS

MLRS Emergency Replenishment (BRIGADIST)

Table L-16

Unit Name	BOH (1%-49%)	Time Period (TP)	Sub-munition
TF 1-77 MECH	36%	TP 13	M933
	32%	TP 14	M933
TF 1-80 MECH	28%	TP 13	M933
	31%	TP 14	M933
TF 1-2 AR	29%	TP 14	M933
	30%	TP 15	M933
TF 1-79 MECH	27%	TP 15	M933
TF 1-4 AR	28%	TP 15	M933

120MM Emergency Replenishment (BRIGADIST)

Table L-17

- Five of the munition types (155MM, MLRS, LONGBOW, 2.75RKT, and STINGER) required emergency resupply for the CORPS. Tables L-15a through L-19a depict specific unit, time period, and sub-munition type which generate an emergency resupply request.

Unit Name	BOH (1% - 49%)	Time Period (TP)	Sub-munition
3RD BN 63TH FA BDE (155 SP)	33% 3% 47% 35% 19% 29% 41% 30% 23% 31% 42% 24% 6% 34% 35% 46%	TP 2 TP 2 TP 3 TP 3 & 4 TP 4 TP 6 TP 8, 9, 10, 15 TP 9 TP 10 TP 10 TP 11 TP 11 TP 14 TP 14 TP 15 TP 15	M795 XM898 M483A1 M795 M483A1 M483A1 M449A1 M795 M483A1 M795 M449A1 M483A1 M449A1 M549A1 XM898
4TH BN 63TH FA BDE (155 SP)	47% 22% 33% 35% 36% 47% 44% 26% 26% 31% 24% 2% 18% 4%	TP 1 TP 2 TP 2 TP 3 TP 4 TP 4 TP 5 TP 9 TP 9 & 10 TP 9 TP 12 TP 14 & 15 TP 15 TP 15	M549A1 M449A1 M795 M795 M795 XM898 M483A1 M483A1 M795 XM982 M864 XM982 M449A1 M795
3RD BN 65TH FA BDE (MLRS)	21% 34% 3% 22% 35% 41% 37% 49% 34% 36% 21% 19% 37% 18% 1% 20% 35% 26% 20% 10%	TP 1 TP 1 & 7 TP 1, 2, 3 TP 2 & 10 TP 2 TP 3 TP 5 & 10 TP 8 TP 8 TP 8 TP 9 TP 9 TP 9 & 10 TP 9 TP 10 TP 10 TP 11 TP 11 TP 11 TP 14 & 15	M549A1 M795 M864 M549A1 M795 M549A1 M449A1 M483A1 M549A1 M795 M449A1 M483A1 M795 M864 M483A1 M864 M449A1 M483A1 M449A1 M864
A BTRY 1ST BN 67TH FA BDE (155 T)	47%	TP 12	M107 (CB)
B BTRY 1ST BN 67TH FA BDE (155 T)	45%	TP 13	M107 (CB)
C BTRY 1ST BN 67TH FA BDE (155 T)	50%	TP 11	M107 (CB)
A BTRY 2ND BN 67TH FA BDE (155 T)	10% 49% 11%	TP 11 & 12 TP 12 TP 13	XM898 M107 (CB) XM898
B BTRY 2ND BN 67TH FA BDE (155 T)	11% 12%	TP 11 & 12 TP 13	XM898 XM898
C BTRY 2ND BN 67TH FA BDE (155 T)	11% 12%	TP 11 & 12 TP 13	XM898 XM898

155MM Emergency Replenishment (CORPS)
Table L-15a

Unit Name	BOH (1% - 49%)	Time Period (TP)	Sub-munition
1ST BN 63TH FA BDE (MLRS)	46% 47% 48% 49% 33%	TP 3 & 4 TP 5 TP 11 TP 12 TP 13	M26 M26 M26 M26 ER-MLRS
2ND BN 63TH FA BDE (MLRS)	31%	TP 10	ER-MLRS
1ST BN 65TH FA BDE (MLRS)	47% 14% 29% 21% 43% 28% 35% 36%	TP 1 TP 2 TP 2-5 TP 8 TP 9 TP 13 TP 14 TP 15	ER-MLRS ER-MLRS M26 M26 M26 M26 M26 M26
2ND BN 65TH FA BDE (MLRS)	45% 32% 38% 33% 42% 44% 9%	TP 1 TP 2 TP 2 & 3 TP 3 TP 4 TP 11 & 12 TP 13	MSTAR M26 MSTAR M26 MSTAR M26 M26
2ND BN 69TH FA BDE (MLRS)	47% 35% 18% 38% 49% 43%	TP 2 & 6 TP 4 TP 5 TP 10 & 11 TP 12 TP 14	M26 M26 ER-MLRS M26 M26 M26
3RD BN 69TH FA BDE (MLRS)	18% 45% 22% 25% 26% 35% 5%	TP 3 TP 4 TP 5 TP 5 TP 6 TP 7 TP 8	ER-MLRS M26 ER-MLRS M26 M26 ER-MLRS ER-MLRS

MLRS Emergency Replenishment (CORPS)

Table L-16a

Unit Name	BOH (1% - 49%)	Time Period (TP)	Sub-munition
3RD BN 102ND ATK HEL RGT	38%	TP 7	LONGBOW

LONGBOW Emergency Replenishment (CORPS)

Table L-17a

Unit Name	BOH (1% - 49%)	Time Period (TP)	Sub-munition
2ND BN 102ND ATK HEL RGT	47%	TP 11	2.75RKT

2.75RKT Emergency Replenishment (CORPS)

Table L-18a

Unit Name	BOH (1% - 49%)	Time Period (TP)	Sub-munition
2ND BN 102ND ATK HEL RGT	44%	TP 11	STINGER

STINGER Emergency Replenishment

Table L-19a

- Zero Balance on Hand: This column indicates whether or not the BOH by munition type at any unit fell to zero. Two of the munition types (155MM and MLRS) experience a zero balance on hand for the BRIGADIST. Tables L-21 through L-22 depict specific unit, time period, and sub-munition type which experience a zero balance on hand.

Unit Name	BOH(=0)	Time Period(TP)	Sub-munition
1ST BN 3D FA (155 SP)	0% 0% 0%	TPs 13-15 TPs 14 & 15 TP 14 & 15	M449A1 M864 XM982
2ND BN 3D FA (155 SP)	0% 0% 0% 0%	TPs 11-13,15 TP 15 TP 15 TP 15	M449A1 M483A2 M864 XM982

155MM Zero Balance (BRIGADIST)

Table L-18

Unit Name	BOH(=0)	Time Period(TP)	Sub-munition
A BTRY 3D FA (MLRS)	0%	TP 14 & 15	M26

MLRS Zero Balance (BRIGADIST)

Table L-19

- Two of the munition types (155MM and MLRS) experience a zero balance on hand for the CORPS. Tables L-18a and L-19a depict specific unit, time period, and sub-munition type which experience a zero balance on hand.

Unit Name	BOH(=0)	Time Period(TP)	Sub-munition
3RD BN 63TH FA BDE (155 SP)	0% 0% 0% 0%	TP 1,2,8-11,13-15 TP 2 TP 9,14,15 TP 9-15	M864 M449A1 M483A1 XM982
4TH BN 63TH FA BDE (155 SP)	0% 0% 0%	TP 1,8,10,13,14,15 TP 10 & 13 TP 11 & 15	M864 XM982 M483A1
3RD BN 65TH FA BDE (155 SP)	0% 0% 0% 0% 0%	TP 1,2,8,10,11 TP 13-15 TP 9 & 13 TP 11 & 13 TP 13 & 15	XM982 XM982 M549A1 M864 M449A1
A BTRY 2ND BN 67TH FA BDE (155 T)	0% 0% 0% 0% 0% 0% 0%	TP 1,2,11,13 TP 1 & 2 TP 1 & 2 TP 1-4,11-15 TP 1 & 2 TP 1,2,3,11-15 TP 9,11-15	M107(CB) M449A1 M483A1 M864 XM898 XM982 M549A1
B BTRY 2ND BN 67TH FA BDE (155 T)	0% 0% 0% 0% 0% 0% 0%	TP 1 & 2 TP 1 & 2 TP 1 & 2 TP 1,2,11-15 TP 1 & 2 TP 1,2,3,11-15 TP 6,7,11-15 TP 6,7,15	M107(CB) M449A1 M483A1 M864 XM898 XM982 M549A1 M795
C BTRY 1ST BN 67TH FA BDE (155 T)	0% 0% 0% 0% 0% 0% 0%	TP 1,2,13,14 TP 1 & 2 TP 1 & 2 TP 1,2,11,12,14,15 TP 1 & 2 TP 1,2,3,11-15 TP 6,7,11-15 TP 6 & 7	M107(CB) M449A1 M483A1 M864 XM898 XM982 M549A1 M795
A BTRY 2ND BN 67TH FA BDE (155 T)	0% 0% 0% 0% 0% 0%	TP 1,2,6,7,11-15 TP 6,7,11-15 TP 6,7,10-15 TP 11 & 13 TP 11,12,13 TP 11-15	XM982 M549A1 M795 M107(CB) M449A1 M864

Unit Name	BOH(=0)	Time Period(TP)	Sub-munition
B BTRY 2ND BN 67TH FA BDE (155 T)	0% 0% 0% 0% 0%	TP 1,2,6,7,11-15 TP 6,11-15 TP 6,7,10-13,15 TP 11-15 TP 12 & 13	XM982 M549A1 M795 M864 M107(CB)
C BTRY 2ND BN 67TH FA BDE (155 T)	0% 0% 0% 0% 0%	TP 1,2,6,7 TP 10-15 TP 11-15 TP 11 TP 12,13,15	XM982 M795 M864 M107(CB) M549A1

155MM Zero Balance (CORPS)

Table L-18a

Unit Name	BOH(=0)	Time Period(TP)	Sub-munition
1ST BN 63TH FA BDE (MLRS)	0% 0%	TPs 10-12,14,15 TPs 14 & 15	ER-MLRS M26
2ND BN 63TH FA BDE (MLRS)	0% 0%	TPs 11,12,14,15 TP 14 & 15	ER-MLRS M26
1ST BN 65TH FA BDE (MLRS)	0%	TP 11	M26
2ND BN 69TH FA BDE (MLRS)	0% 0%	TPs 3,8,9,13-15 TPs 7 & 15	ER-MLRS M26

MLRS Zero Balance (CORPS)

Table L-19a

(c) Problems. Of the 733 stons ordered, via standard resupply, 581 stons were shipped (approximately 79.3 percent) for the BRIGADIST. Problems in unfilled orders are associated with unavailable transporters or replenishments (reference table L-20).

TP	REQUESTING UNIT	SUPPLY UNIT	SUPPLY TYPE	AMOUNT REQUESTED (Rounds)	AMOUNT SHIPPED (Rounds)	AMOUNT SHORTED (%)	TRUCKS AVAIL	AVAIL STOCKS (Rounds)
11	B3002H2	B302HFC	M107(CB)	449.85	234	47.98	16	0
11	B3003H2	B303HFC	M107(CB)	293.08	234	20.16	16.6	0
12	B30A00H	B003ASP	LONGBOW	394.65	100	74.66	92.8	0
13	B30A00H	B003ASP	B30MM	23,187.51	15,755.01	32.05	0	961,668.9
13	B3001H2	B301HFC	M107(CB)	392.3	234	40.35	11.4	0
13	B3001H2	B301HFC	M795	329.7	288	12.65	11.4	0
13	B3002H2	B302HFC	M795	341.57	51.08	85.05	15.8	0
13	B300AM2	B304ATP	M26	82.66	22.4	72.9	0	490
14	B30A00H	B3000FC	STINGER	99.81	0.11	99.89	0	137.4
14	B3002H2	B302HFC	M449A1	56.76	46.74	17.65	14.3	0
15	B300AM2	B304ATP	MSTAR	9	0.25	97.22	0	40.1
15	B300AM2	B304ATP	MSTAR	8.43	4.66	44.72	0	40.1
	TOTAL			31,371.2	16,970.25	45.9		

Problems Filling Maneuver Unit Orders (BRIGADIST), Class V

Table L-20

- Of the 5478 stons ordered, via standard resupply, 4965 stons were shipped (approximately 90.6 percent) for the CORPS. Problems in unfilled orders are associated with unavailable transporters or replenishments (reference table L-20a).

TP	REQUESTING UNIT	SUPPLY UNIT	SUPPLY TYPE	AMOUNT REQUESTED (Rounds)	AMOUNT SHIPPED (Rounds)	AMOUNT SHORTED (\$)	TRUCKS AVAIL	AVAIL STOCKS (Rounds)
2	B00E00H	B001ASP	LONGBOW	1,201.87	100	91.68	1.1	0
9	B00C3H2	B001ASP	M483A1	1,399.7	427.94	69.43	0	143,506.9
9	B00A3H2	B001ASP	M483A1	1,689.38	504.4	70.14	0	143,506.9
9	B00A3H2	B001ASP	XM982	176.45	0	100	0	3,221.7
10	B00A4H2	B001ASP	M483A1	1,422.63	637.71	55.17	0	142,451.2
10	B00C3H2	B001ASP	M483A1	1,542.12	306.94	80.1	0	142,451.2
10	B00A4H2	B001ASP	M864	147.12	0	100	0	2,319.8
11	B00FOOH	B001ASP	2.75RKT	2,797.62	793.12	71.65	0	5,597.4
11	B00FOOH	B001ASP	B30MM	18,262.52	0	100	0	893,900.1
	TOTAL			31,371.2	2,770.11	91.17		

Problems Filling Maneuver Unit Orders (CORPS), Class V
Table L-20a

- The problems of unfilled orders have rippled into maneuver units. In the table below, supply type-maneuver unit combinations that have a zero BOH are presented. The table has been coded: 0 - time and distance problems; 1 - unsupported materiel; 2 - insufficient replenishment stockages; and 3 - unavailable transporters. Generally, once a unit experienced a zero BOH, the zero BOH continued to the end of the scenario.

- From table 21 (BRIGADIST) and table L-21a (CORPS), zero BOH are attributed to shortages of transporters, shortages of replenishments, and large time-distances between maneuver units and their supporting CSS unit. The reader is cautioned regarding the "0"; some maneuver units consume everything on-hand, and cannot be provided a supply type fast enough regardless of the speed of the CSS system.

Supply Type	Maneuver Unit	TP															# of TPs
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M26	B300AM2														0,3	0,3	2
M449A1	B3001H2												0	0	0		3
M449A1	B3002H2										0	0	0		0		4
M483A1	B3002H2														0		1
M864	B3001H2													0	0		2
M864	B3002H2													0		1	
XM982	B3001H2													0	0		2
XM982	B3002H2													0		1	

Causes for Zero BOH (BRIGADIST)
Table L-21

Supply Type	Maneuver Unit	TP															# of TPs
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
ER-MLRS	B00A1M2										0	0	0		0	0	5
ER-MLRS	B00A2M2										0	0		0	0	0	4
ER-MLRS	B00G2M2			0					0	0			0	0	0		6
M107(CB)	B00E1T2	0	0								0	0					4
M107(CB)	B00E2T2	0	0														2
M107(CB)	B00E3T2	0	0										0	0			4
M107(CB)	B00E4T2										0	0					2
M107(CB)	B00E5T2										0	0					2
M107(CB)	B00E6T2									0							1
M26	B00A1M2												0	0			2
M26	B00A2M2												0	0			2
M26	B00C1M2									0							1
M26	B00G2M2							0						0			2
M449A1	B00A3H2	0															1
M449A1	B00C3H2											0	0				2
M449A1	B00E1T2	0	0														2
M449A1	B00E2T2	0	0														2
M449A1	B00E3T2	0	0														2
M449A1	B00E4T2										0	0	0				3
M483A1	B00A3H2							0,3					0,3	0,3			3
M483A1	B00A4H2								0,3				0,3				2
M483A1	B00E1T2	0	0														2
M483A1	B00E2T2	0	0														2
M483A1	B00E3T2	0	0														2
M549A1	B00C3H2								0				0				2
M549A1	B00E1T2								0		0	0	0	0	0		6
M549A1	B00E2T2						0	0			0	0	0	0	0		7
M549A1	B00E3T2					0	0			0	0	0	0	0			7
M549A1	B00E4T2					0	0			0	0	0	0	0			7
M549A1	B00E5T2					0				0	0	0	0	0			6
M549A1	B00E6T2										0	0		0			3
M795	B00E2T2					0	0									0	3
M795	B00E3T2					0	0										2
M795	B00E4T2					0	0			0	0	0	0	0			8
M795	B00E5T2					0	0			0	0	0	0	0			7
M795	B00E6T2									0	0	0	0	0			6
M864	B00A3H2	0	0					0	0	0	0		0	0	0		9
M864	B00A4H2	0						0		0,3			0,3	0,3	0,3		6
M864	B00C3H2									0		0					2
M864	B00E1T2	0	0			0	0				0	0	0	0	0		9

Supply Type	Maneuver Unit	TP															# of TPs	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
M864	B00E2T2		0	0								0	0	0	0	0	7	
M864	B00E3T2		0	0								0	0		0	0	6	
M864	B00E4T2											0	0	0	0	0	5	
M864	B00E5T2											0	0	0	0	0	5	
M864	B00E6T2											0	0	0	0	0	5	
XM898	B00E1T2		0	0													2	
XM898	B00E2T2		0	0													2	
XM898	B00E3T2		0	0													2	
XM982	B00A3H2									0,3	0,3	0,3	0,3	0,3	0,3	0,3	7	
XM982	B00A4H2										0			0			2	
XM982	B00C3H2		0	0					0		0	0		0	0	0	8	
XM982	B00E1T2		0	0				0				0	0	0	0	0	8	
XM982	B00E2T2		0	0				0				0	0	0	0	0	8	
XM982	B00E3T2		0	0				0				0	0	0	0	0	8	
XM982	B00E4T2		0	0				0	0			0	0	0	0	0	9	
XM982	B00E5T2		0	0				0	0			0	0	0	0	0	9	
XM982	B00E6T2		0	0				0	0			0		0	0	0	8	
Total		0	24	24	1	0	0	15	12	4	6	9	32	25	34	30	35	251

Causes for Zero BOH (CORPS)

Table L-21a

To quantify a measure of risk, the maximum consumption of class V by a unit for any TP is compared with the current BOH for each TP; if the value is less than one, the unit would exhaust its supplies prior to repeating the activities of this "maximum" TP. Where "at risk" is less than one TP of supply, class V was generally provided to maneuver units without placing them "at risk". Ten maneuver units were "at risk" for the BRIGADIST (reference Table L-22). Seventeen maneuver units were "at risk" for the CORPS (reference Table L-22a).

MANEUVER UNIT	TP															# of TPs	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
B3001H2	4	4	4	4	4	4	4	4	4	4	4	4	4	7	6	6	16
B3002H2	2	2	2	2	2	2	2	2	2	2	2	5	4	7	5	7	16
B3003H2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	16
B300AM2	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	16
B3011MX														1	1	1	3
B3012MX														1	1	1	3
B3013AR														1	1		2
B3021MX														1	1		2
B3022MX														1			1
B3023AR														1			1

"At Risk" Units (BRIGADIST), Class V Risk

Table L-22

MANEUVER UNIT	TP															# of TPS	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
B00A00H															1	1	2
B00A1M2	1	1	2	2	2	2	1	1	1	1	2	2	2	2	2	2	16
B00A2M2			2	2	2	2	2				2	2	2	2	2	2	11
B00A3H2		2	5	4	5	4	3	2	3	5	6	6	5	5	7	7	15
B00A4H2	1	3	5	4	6	4	4	4	3	5	5	4	4	4	4	5	16
B00C1M2		1	2	1	1	1	1	1	1	1	1	1	2	2	2	2	14
B00C2M2		1	2	2	1							1	1	1	1	1	9
B00C3H2		5	5	4	4	4	4	5	4	6	6	5	5	5	5	5	15
B00E1T2	3	8	8	7	7	7	8	8	7	8	8	8	8	8	8	8	16
B00E2T2	1	6	6	6	6	6	8	8	7	8	8	8	8	8	8	8	16
B00E3T2	1	7	7	7	7	7	8	8	7	7	7	8	8	8	8	8	16
B00E4T2	1	2	2	2	2	2	3	3	2	2	2	7	7	7	6	6	16
B00E5T2	1	2	2	2	2	2	3	3	2	2	2	6	6	6	4	4	16
B00E6T2		1	1	1	1	1	3	3	2	2	2	6	6	6	5	5	15
B00F00H	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	16
B00G2M2		1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	15
B00G3M2			1	2	2	2	1	1								6	

"At Risk" Units (CORPS), Class V Risk
Table L-22a

(d) Observations.

- 1) There were several occurrences of zero balance on hand for the 155MM and MLRS munition types, however, at no time were either all 155MM or MLRS sub-munition categories at zero balance.
- 2) Most problems filling maneuver units orders for Class V were due to nonavailability of transporters; the primary cause for zero balance on hand for Class V was time and distance problems.

APPENDIX A

DDA VIC Name to Unit Name Cross Reference

VIC Name	Unit Name
B000CFC	CFC HQ
B00RCSB	CORPS REAR SPT BN
B02RCSB	CORPS REAR SPT BN
B000000	III CORPS
B000PAT	1ST PATRIOT BN HQ
B001PAT	A BTRY 1ST PATRIOT BN
B002PAT	B BTRY 1ST PATRIOT BN
B003PAT	C BTRY 1ST PATRIOT BN
B004PAT	D BTRY 1ST PATRIOT BN
B00FCSB	CORPS FWD SPT BN
B02FCSB	CORPS FWD SPT BN
B001CSA	III CORPS SUPPORT AREA
B001ASP	501ST FASP-1
B002ASP	501ST FASP-2
B003ASP	501ST FASP-3
B004ASP	503RD FASP-1
B005ASP	503RD FASP-2
B00A002	63TH FA BDE HQ III CORPS ARTY
B00A1M2	1ST BN 63TH FA BDE (MLRS)
B00A2M2	2ND BN 63TH FA BDE (MLRS)
B00A3H2	3RD BN 63TH FA BDE (155 SP)
B00A4H2	4th BN 63TH FA BDE (155 SP)
B00C002	65TH FA BDE HQ III CORPS ARTY
B00C1M2	1ST BN 65TH FA BDE (MLRS)
B00C2M2	2ND BN 65TH FA BDE (MLRS)
B00C3H2	3RD BN 65TH FA BDE (155 SP)
B00E002	67TH FA BDE HQ III CORPS ARTY
B00E1T2	A BTRY 1ST BN 67TH FA BDE (155 T)
B00E2T2	B BTRY 1ST BN 67TH FA BDE (155 T)
B00E3T2	C BTRY 1ST BN 67TH FA BDE (155 T)
B00E4T2	A BTRY 2ND BN 67TH FA BDE (155 T)
B00E5T2	B BTRY 2ND BN 67TH FA BDE (155 T)
B00E6T2	C BTRY 2ND BN 67TH FA BDE (155 T)
B00E7T2	A BTRY 3RD BN 67TH FA BDE (155 T)
B00E8T2	B BTRY 3RD BN 67TH FA BDE (155 T)
B00E9T2	C BTRY 3RD BN 67TH FA BDE (155 T)
B00G002	69TH FA BDE HQ III CORPS ARTY
B00G1M2	1ST BN 69TH FA BDE (MLRS)
B00G2M2	2ND BN 69TH FA BDE (MLRS)
B00G3M2	3RD BN 69TH FA BDE (MLRS)
B00AVNB	10TH AVN BDE III CORPS
B000GRP	103RD AVN GROUP 10TH AVN BDE
B00A00H	1ST BN 103RD AVN GRP
B00B00H	2ND BN 103RD AVN GRP
B000RGT	102ND ATK HEL RGT 10TH AVN BDE
B00E00H	1ST BN 102ND ATK HEL RGT
B00FO0H	2ND BN 102ND ATK HEL RGT

VIC Name	Unit Name
B00G00H	3RD BN 102ND ATK HEL RGT
B3000MX	3D INFANTRY DIVISION (MECH)
B3000FC	3D DIVISION FWD SPT CO
B3010MX	1ST BDE 3D ID
B3010RE	1ST BDE RECON TRP
B3011MX	TF 1-77 MECH
B3011FC	FWD SPT CO
B3012MX	TF 1-80 MECH
B3012FC	FWD SPT CO
B3013AR	TF 1-2 AR
B3013FC	FWD SPT CO
B3001EN	1ST BN, 3RD ENG REGT (3 COS)
B3004EN	551ST EN BN (CORPS)
B300AAD	A CO, 3ID AD BN
B301FSB	FSB 1ST BDE 3D ID
B301ATP	1ST BDE 3ID AMMO TRANS PT
B3020MX	2ND BDE 3D ID
B3020RE	2ND BDE RECON TRP
B3021MX	TF 1-78 MECH
B3021FC	FWD SPT CO
B3022MX	TF 1-79 MECH
B3022FC	FWD SPT CO
B3023AR	TF 1-4 AR
B3023FC	FWD SPT CO
B3002EN	2ND BN, 3RD ENG REGT (3 COS)
B300BAD	B CO, 3ID AD BN
B302FSB	FSB 2ND BDE 3D ID
B302ATP	2ND BDE 3ID AMMO TRANS PT
B3030AR	3RD BDE 52RD ID
B3030RE	3RD BDE RECON TRP
B3031AR	TF 1-3 AR
B3031FC	FWD SPT CO
B3032AR	TF 1-5 AR
B3032FC	FWD SPT CO
B3033MX	TF 1-81 MECH
B3033FC	FWD SPT CO
B3003EN	3RD BN, 3RD ENG REGT (3 COS)
B300CAD	C CO, 3ID AD BN
B303FSB	FSB 3RD BDE 3D ID
B303ATP	3RD BDE 3ID AMMO TRANS PT
B300002	3D DIVISION ARTY
B3001H2	1ST BN 3D FA (155 SP)
B301HFC	1ST BN 3D FA (155 SP) FSC
B3002H2	2ND BN 3D FA (155 SP)
B302HFC	2ND BN 3D FA (155 SP) FSC
B3003H2	3RD BN 3D FA (155 SP)
B303HFC	3RD BN 3D FA (155 SP) FSC
B300AM2	A BTRY 3D FA (MLRS)
B304FSB	FSB DIVARTY 3D ID

VIC Name	Unit Name
B304ATP	3RD BDE 3ID AMMO TRANS PT
B30100H	3D AVN BDE HQ
B3000LH	3D CAV SQDN FARP
B30A00H	1ST ATK BN 3D AVN
B30C00H	3RD LIFT BN 3D AVN

APPENDIX B

DEFINITIONS

Specific supply analysis definitions are listed below:

(1) Amount Authorized of this supply type: Amount of this supply type that this unit is authorized at the end of the TP, this number is calculated by multiplying the number of available systems that use this supply type by the amount authorized per system. This number can change from one TP to another due to weapon losses.

(2) Balance on-Hand of this supply type: Amount of this supply type that this unit has on hand at the end of the TP.

(3) Amount Used during this TP: Amount of this supply type that this unit used during this TP.

(4) Amount Lost during this TP: Amount of this supply type that this unit lost due to attrition of systems (when a system is damaged in combat a percentage (50%) of its on-board supplies are lost).

(5) Ratio of Balance on-Hand to Amount Authorized: A percent value used to indicate overall assessment of a munition; when this percent value is low, a greater risk is indicated as to possibility of exhausting all supplies.

(6) Total Amount Authorized during this TP: The sum of each amount authorized of each supply type at the end of the TP. The stockages are redistributed, consumed, or lost as the scenario proceeds. As units are engaged and attrited, the amount-authorized is reconciled with the number of surviving weapon systems.

(7) Total Amount on-Hand during this TP: The sum of the amount of each supply type that the units actually have in stock at the end of the TP. This amount is reduced by consumption, attrition, and other activities that may reduce the stockage of a supply type.

(8) Total Amount Used during this TP: The sum of the amount of each supply type consumed as a result of movement and combat at the end of the TP.

(9) Total Amount Lost during this TP: The sum of the amount of each supply type lost due to attrition of systems at the end of the TP (when a system is damaged in combat, a percentage of its on-board supplies are lost).

(10) Total Amount on-Order during this TP: The sum of the amounts of each supply ordered by each unit during a period. As materiel is consumed, units initiate orders based on a re-order threshold to restock its supplies. If an order cannot be shipped for reasons of shortages of stocks or movers, a unit will re-order the replenishments during the next period.

(11) Timely fashion: The manner in which a unit is supported when a negative consequence did not result. When a maneuver unit calls for replenishment of supplies, the support of the maneuver unit shall be said to be in a "timely fashion," if the maneuver unit did not suffer for lack of supplies. For class III, a unit suffers when it is forced to stop for lack of class III. For class V, a unit suffers a negative consequence when it exhausts a class V supply type.

(12) Risk: The proportion of TPs that each supply type for each unit can be expected to last given the greatest consumption for the scenario. The higher the measure, the greater the quantity of stockage, hence the lower the likelihood of not being able to repeat the highest consumption of a TP.

(13) Standard Resupply: Maneuver units will generate an order for a supply type when, per the resupply schedule, the on-hand plus on-order quantity is less than 75 percent of the authorized quantity. The magnitude of the order is the amount of each supply type to bring the on-hand plus on-order quantity up to the authorized quantity. Routinely, the order is for 25% of authorized. When the shipment arrives, the on-hand balance will increase, and the maneuver unit will issue an order when the on-hand quantity again falls below the 75% authorized. Exceptions to this resupply process occur when, for lack of trucks or stocks, an order cannot be filled or shipped. When the order (or portion of same) cannot be shipped in the period it was requested, the unfilled portion is lost - there are no backorders or due-outs. The maneuver unit will reassess its needs during the next period. Standard resupply can be divided into two types: supply point distribution (SPD) and unit distribution (UD). A unit that uses SPD provides its own organic transporters to convey replenishments between the supply unit(s) and itself; a unit using UD requires the supply unit to provide both replenishments and transporters.

(14) Emergency Resupply: Maneuver units will generate an "emergency" order for a supply type when, per the resupply schedule, the on-hand plus on-order quantity is less than 50 percent of the authorized quantity. The magnitude of the order is the amount of each supply type to bring the on-hand quantity up to 50% of the authorized quantity. When the shipment arrives, the on-hand balance will increase. This is "emergency resupply." Emergency resupply is subject to a number of factors: (1) the availability of replenishment stockages; (2) the availability of helicopter support to provide airlift between the supporting CSS unit(s) and the requesting maneuver unit; and (3) the hostile environment surrounding the maneuver unit. If the scenario is short-lived or has intensive combat, the last factor can be the most limiting. Helicopters will not provide lift to maneuver units that are under assault. If any one of the factors prohibits emergency resupply, the "emergency" request for replenishments will be routed for "standard" resupply. When the order (or portion of same) cannot be shipped in the time period it was requested, the unfilled portion is lost - there are no backorders or due-outs - the unit must wait for the next period per the resupply schedule to assess its stockage position and re-order.

APPENDIX C

FIGURES AND TABLES

Unit Name	Amount Shipped	# of Deliveries	Minimum Time to Deliver	Avg. Time to Deliver	Maximum Time to Deliver
B001CSA	240,299.05	32	6.41	8.7	12.74
B00FCSB	1,008.11	2	10.17	10.98	11.78
B00RCSB	27,504.96	47	1.1	1.33	1.54
B02RCSB	1,186.81	15	4.01	4.57	5.42
B3000FC	5,831.16	9	0.49	3.66	7.71
B3011FC	4,082.48	1	3.84	3.84	3.84
B3012FC	3,854.98	1	3.97	3.97	3.97
B3013FC	10,501.37	2	3.61	5.16	6.71
B301FSB	7,283.15	4	2.74	4.99	6.89
B301HFC	6,629.56	4	1.67	3.55	6.4
B3021FC	7,482.84	2	2.77	4.32	5.87
B3022FC	7,563.6	2	2.85	4.45	6.05
B3023FC	10,189.17	2	2.92	4.22	5.51
B302FSB	2,743.18	2	0.5	1.63	2.76
B302HFC	7,080.95	4	1.75	2.62	3.96
B3031FC	9,834.02	2	4.34	5.39	6.44
B3032FC	9,883.55	2	3.45	4.87	6.29
B3033FC	4,042.22	1	4.14	4.14	4.14
B303FSB	2,806.55	2	2.36	3.5	4.63
B303HFC	5,365	3	1.19	2.63	4.76

Unit Name	Amount Shipped	# of Non-Deliveries	Minimum Time to Deliver	Avg. Time to Deliver	Maximum Time to Deliver
B001CSA	37,232.37	5	0.75	4.85	11
B00RCSB	1,196.57	2	0	0.5	1
B02RCSB	1,196.93	1	2	2	2
B3000FC	14,788.35	5	0.75	4.1	7.75
B3012FC	3,062.01	1	7	7	7
B3023FC	4,468.88	1	4	4	4
B302FSB	2,831.4	1	2	2	2
B3032FC	5,216.65	1	2	2	2
B3033FC	3,875.29	1	3	3	3
B303HFC	1,847.89	1	5	5	5

Order to Deliver, Class III
Table C-1

Unit Name	Amount Shipped	# of Deliveries	Minimum Time to Deliver	Avg Time to Deliver	Maximum Time to Deliver
B001ASP	171,884.05	211	6.08	11.49	18.03
B003ASP	39,060.69	6	4.57	5.1	7.21
B3000FC	52.06	1	15.75	15.75	15.75
B3011FC	169.07	2	6.56	6.72	6.88
B3012FC	191.97	1	10	10	10
B301HFC	1,799.54	8	5.44	5.7	6.49
B302HFC	1,112.91	7	2.56	3.09	3.7
B303HFC	343.09	3	2.55	5.05	5.67
B304ATP	299.81	5	3.54	5.76	6.88
Unit Name	Amount Shipped	# of Non-Deliveries	Minimum Time to Deliver	Avg Time to Deliver	Maximum Time to Deliver
B001ASP	6,254.04	57	0.13	9.09	36
B3000FC	62.04	2	2.75	5.25	7.75
B3013FC	197.82	1	7	7	7
B301HFC	100.73	1	5.14	5.14	5.14
B3022FC	219.4	1	2	2	2
B3023FC	212.2	1	1	1	1
B302HFC	577.24	2	1.66	2.14	2.62
B304ATP	4.91	2	0	1	2

Order to Deliver, Class V
Table C-2

TP	USED GALS	LOST GALS	REQUIREMENT CONSUMED	AMOUNT RECEIVED BY AIR	AMOUNT RECEIVED BY TRUCK	AMOUNT REQUESTED	AMOUNT SHIPPED	% of ORDERED
0	0	0	0	0	0	0	0	---
1	7,620	0	7,620	0	0	0	0	---
2	4,256	0	4,256	0	0	0	0	---
3	5,205	0	5,205	0	0	0	0	---
4	3,954	0	3,954	0	0	0	0	---
5	5,409	0	5,409	0	548	548	548	100
6	11,637	0	11,637	0	3,439	3,439	3,439	100
7	9,977	0	9,977	0	0	1,965	1,965	100
8	9,748	0	9,748	0	1,965	589	589	100
9	14,059	0	14,059	0	589	6,248	5,869	94
10	16,442	0	16,442	0	5,869	10,495	10,495	100
11	31,416	4	31,419	0	10,495	27,323	27,323	100
12	30,217	24	30,241	0	24,624	26,455	26,455	100
13	31,306	659	31,965	0	18,781	33,143	33,143	100
14	34,589	2,807	37,396	0	22,981	24,396	19,668	100
15	25,648	1,071	26,719	0	16,335	18,089	18,054	100
TOTAL	241,481	4,564	246,045	0	105,625	152,688	147,547	100

Consumption of Class III (BRIGADIST), Gallons

Table C-3

TP	USED STONS	LOST STONS	REQUIREMENT CONSUMED	AMOUNT RECEIVED BY AIR	AMOUNT RECEIVED BY TRUCK	AMOUNT REQUESTED	AMOUNT SHIPPED	% of ORDERED
0	0	0	0	0	0	0	0	---
1	0	0	0	0	0	---	---	---
2	0	0	0	0	0	---	---	---
3	0	0	0	0	0	---	---	---
4	0	0	0	0	0	---	---	---
5	0	0	0	0	0	---	---	---
6	0	0	0	0	0	---	---	---
7	0	0	0	0	0	---	---	---
8	0	0	0	0	0	---	---	---
9	0	0	0	0	0	---	---	---
10	0	0	0	0	0	---	---	---
11	171	0	172	0	0	117	97	83
12	40	0	40	2	97	119	92	77
13	424	4	427	2	31	342	274	80
14	418	8	426	108	102	50	45	90
15	350	9	359	2	125	104	73	70
TOTAL	1,403	21	1,423	115	356	733	581	79

Consumption of Class V (BRIGADIST), STONS

Table C-4

TP	USED GALS	LOST GALS	REQUIREMENT CONSUMED	AMOUNT RECEIVED BY AIR	AMOUNT RECEIVED BY TRUCK	AMOUNT REQUESTED	AMOUNT SHIPPED	% of ORDERED
0	0	0	0	0	0	0	0	---
1	37,260	730	37,990	0	0	0	0	---
2	64,900	883	65,783	0	0	93,814	42,284	45
3	22,788	540	23,328	0	0	9,783	1,185	12
4	42,618	231	42,849	0	1,179	133,978	2,442	2
5	29,049	0	29,049	0	3,577	67,098	60,232	90
6	50,107	81	50,188	0	3,584	182,953	3,651	2
7	20,236	80	20,317	0	3,593	193,902	56,208	29
8	36,041	600	36,641	0	2,396	72,355	8,726	12
9	13,727	154	13,881	0	3,594	120,312	3,646	3
10	70,981	80	71,061	0	3,590	152,073	62,977	41
11	39,406	365	39,770	19,818	3,587	100,096	18,426	18
12	33,031	353	33,384	0	2,395	60,119	10,223	17
13	47,276	520	47,796	0	2,394	66,611	11,547	17
14	40,707	267	40,974	0	2,902	54,521	2,393	4
15	11,622	481	12,104	0	2,897	125,845	31,674	25
TOTAL	559,748	5,365	565,113	19,818	35,689	1,133,160	315,613	22

Consumption of Class III (CORES), Gallons

Table C-3a

TP	USED STONS	LOST STONS	REQUIREMENT CONSUMED	AMOUNT RECEIVED BY AIR	AMOUNT RECEIVED BY TRUCK	AMOUNT REQUESTED	AMOUNT SHIPPED	% of ORDERED
0	0	0	0	0	0	0	0	---
1	1,238	19	1,256	0	0	911	911	100
2	1,259	23	1,282	170	0	1,001	900	90
3	198	8	206	52	264	222	222	100
4	459	2	461	89	492	213	213	100
5	192	0	192	230	342	103	103	100
6	443	1	445	48	586	231	231	100
7	522	1	523	81	477	148	148	100
8	456	11	467	131	193	440	440	100
9	477	5	482	44	96	506	320	63
10	560	1	562	52	66	502	330	66
11	624	11	634	47	252	405	351	87
12	217	12	229	192	544	48	48	100
13	1,020	14	1,034	33	320	442	442	100
14	1,013	7	1,020	202	287	253	253	100
15	289	10	299	0	36	54	54	100
TOTAL	8,967	125	9,092	1,371	3,953	6,478	4,965	91

Consumption of Class V (CORES), STONS

Table C-4a

CLASS III & V (BRIGHTLIST), TRUCKLOADS BY TYPE												TOTAL				
TP	BR MTRS	M105 (CB)	N26	M49A1	M48A1	M57A1	M795	M64	M533	M64A1	POL-BAGET	STINGER	XN9898	XN982		
1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
5	---	---	---	---	---	---	---	---	---	0.46	---	---	---	0.46	0.46	
6	---	---	---	---	---	---	---	---	---	1.38	---	---	---	1.38	1.38	
7	---	---	---	---	---	---	---	---	---	0.79	---	---	---	0.79	0.79	
8	---	---	---	---	---	---	---	---	---	1.28	---	---	---	1.28	1.28	
9	---	---	---	---	---	---	---	---	---	4.20	---	---	---	4.20	4.20	
10	---	---	---	---	---	---	---	---	---	7.90	---	---	---	7.90	7.90	
11	---	2.10	2.16	---	---	0.67	---	---	---	14.84	---	---	---	19.77	19.77	
12	0.03	2.10	2.16	---	0.59	0.67	0.31	---	---	20.18	---	0.48	---	0.21	26.73	
13	0.11	1.11	3.51	---	2.52	0.59	1.94	0.55	1.02	---	20.99	2.33	0.48	---	0.82	35.97
14	0.08	1.11	3.51	0.16	3.52	---	1.94	0.24	1.67	---	23.32	5.50	0.00	0.29	0.61	41.95
15	0.08	---	3.51	0.16	3.56	---	0.21	2.95	2.13	19.57	5.41	0.57	0.29	0.19	38.63	

CLASS III & V (DRUGISM), PERCENTAGE BY TRUCKLOADS ON-ROAD, CSSTO-MANEUVER UNITS												TOTAL		
TRP	EN-MERS	M101(CD)	R26	M1491	M18311	M1951	M1961	M19713	M201	POI-B	POI-BACPT	STINGER	XN998	XN998?
1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	100	---	---	---	100	100
6	---	---	---	---	---	---	---	---	100	---	---	---	100	100
7	---	---	---	---	---	---	---	---	100	---	---	---	100	100
8	---	---	---	---	---	---	---	---	100	---	---	---	100	100
9	---	---	---	---	---	---	---	---	100	---	---	---	100	100
10	---	---	---	---	---	---	---	---	100	---	---	---	100	100
11	---	10.62	10.93	---	---	3.39	---	---	75.06	---	---	---	100	100
12	0.11	7.86	8.08	---	2.21	2.51	1.16	---	75.5	---	1.8	---	0.79	100
13	0.31	3.09	9.76	---	7.01	1.64	5.39	1.53	2.84	---	58.35	6.48	1.33	2.28
14	0.19	2.65	8.37	0.38	8.39	---	4.62	0.57	3.98	---	55.59	13.11	0	0.69
15	0.21	---	9.09	0.41	9.22	---	---	0.54	7.64	5.51	50.66	14	1.48	0.75

Truckloads On-Road, CSS-to-Maneuver Units
Table C-5

CLASS III & IV (CORS) TRUCKLOADS BY TP																	
TP	2.75KRT	ER-MURS	LONGBOW	M107 (CB)	M26	M44A1	M483A1	M54A1	M75	M864	MSTAR	POLB	POLBACFT	SPINGER	XMB8	XMB8	TOTAL
1	---	0.53	---	3.27	10.13	0.36	3.45	9.16	2.66	4.41	16.86	---	---	---	1.95	2.74	55.52
2	---	1.27	16.71	7.04	33.97	0.96	11.48	9.16	6.27	4.41	20.36	---	37.52	3.12	3.87	2.96	159.1
3	---	1.67	16.71	7.04	38.42	0.96	15.73	9.16	6.27	4.41	23.68	---	45.69	3.12	3.87	2.96	179.69
4	---	2.14	16.71	3.77	42.48	0.60	16.42	8.15	3.61	1.46	23.68	---	116.25	3.12	2.94	1.22	242.55
5	---	1.97	16.71	5.34	38.77	1.32	16.62	2.02	3.61	0.20	12.61	---	159.75	1.56	2.26	0.56	263.3
6	---	1.58	---	5.34	39.73	1.32	21.22	5.45	3.53	0.54	3.32	---	182.51	---	0.49	1.03	266.06
7	3.03	0.82	---	4.83	23.48	1.32	15.44	5.45	4.28	1.00	---	---	161.03	---	0.49	1.03	222.2
8	3.03	1.26	---	6.60	19.50	0.72	11.48	8.52	5.32	2.42	---	---	136.02	---	1.22	196.09	
9	3.03	1.26	---	5.03	17.38	0.91	38.65	3.88	4.96	2.36	2.63	---	131.15	---	2.73	216.97	
10	6.46	2.27	---	5.03	18.68	0.91	53.45	3.88	6.72	2.36	2.63	---	161.09	0.51	---	3.71	270.7
11	8.09	2.27	---	4.75	30.74	1.40	50.87	6.51	6.72	4.57	2.63	0.84	131.78	0.51	0.79	4.43	256.9
12	11.10	1.94	5.49	3.82	29.28	1.72	38.28	7.08	2.35	4.11	2.63	1.68	90.38	0.51	0.79	4.43	205.59
13	13.02	2.45	5.49	4.71	29.10	0.81	18.46	4.52	2.80	2.21	9.86	4.62	77.88	0.64	0.79	2.18	179.54
14	5.35	1.44	---	6.43	25.18	0.81	7.73	9.72	1.52	1.10	7.23	4.62	75.08	0.64	1.32	1.79	149.96
15	5.35	1.44	---	5.07	14.93	0.64	9.73	6.85	2.61	---	7.23	17.61	86.49	0.64	0.80	1.07	160.46

CLASS III & IV (CORS) TRUCKLOADS BY TP																	
TP	2.75KRT	ER-MURS	LONGBOW	M107 (CB)	M26	M44A1	M483A1	M54A1	M75	M864	MSTAR	POLB	POLBACFT	SPINGER	XMB8	XMB8	TOTAL
1	---	0.95	---	5.89	18.25	0.65	6.21	16.5	4.79	7.94	30.37	---	---	---	3.51	4.94	100
2	---	0.8	10.5	4.42	21.35	0.6	7.22	5.76	3.94	2.77	12.8	---	23.58	1.96	2.43	1.86	100
3	---	0.93	9.3	3.92	21.38	0.53	8.75	5.1	3.49	2.45	13.18	---	25.43	1.74	2.15	1.65	100
4	---	0.88	6.89	1.55	17.51	0.25	6.77	3.36	1.49	0.6	9.76	---	47.93	1.29	1.21	0.5	100
5	---	0.75	6.35	2.03	14.72	0.5	6.31	0.77	1.37	0.08	4.79	---	60.67	0.59	0.86	0.21	100
6	---	0.59	---	2.01	14.93	0.5	7.98	2.05	1.33	0.2	1.25	---	68.6	---	0.18	0.39	100
7	1.36	0.37	---	2.17	10.57	0.59	6.95	2.45	1.93	0.45	---	---	72.47	---	0.22	0.46	100
8	1.55	0.64	---	3.37	9.94	0.37	5.85	4.34	2.71	1.23	---	---	69.37	---	---	0.62	100
9	1.4	0.58	---	2.32	8.01	0.42	17.81	1.79	2.29	1.09	1.21	---	61.83	---	---	1.26	100
10	2.39	0.84	---	1.86	6.9	0.34	19.75	1.43	2.48	0.87	0.97	---	60.62	0.19	---	1.37	100
11	3.15	0.88	---	1.85	11.97	0.54	19.8	2.53	2.62	1.78	1.02	0.33	51.3	0.2	0.31	1.72	100
12	5.4	0.94	2.67	1.86	14.24	0.84	18.62	3.44	1.14	2	1.28	0.82	43.96	0.25	0.38	2.15	100
13	7.25	3.06	2.62	16.21	0.45	10.28	2.52	1.56	1.23	5.49	2.57	43.38	0.36	0.44	1.21	100	
14	3.57	0.96	---	4.29	16.79	0.54	5.15	6.48	1.01	0.73	4.82	3.08	50.07	0.43	0.88	1.19	100
15	3.33	0.9	---	3.16	9.3	0.4	6.06	4.27	1.63	---	4.51	10.97	53.9	0.4	0.5	0.67	100

Truckloads On-Road, CSS-to-Maneuver Units
Table C-5

CLASS III AMOUNT ON-HAND BY UNIT BY IP									
	B001CSA	B001CSB	B001CSB	B02FCB	B02FCB	B301FEC	B301FEC	B301FEC	B301FEC
0	2,412,500	480,000	575,000	480,000	575,000	182,400	12,500	22,500	212,400
1	2,412,500	480,000	575,000	480,000	575,000	182,400	12,500	22,500	212,400
2	2,370,216	480,000	575,000	480,000	575,000	182,400	12,500	22,500	212,400
3	2,369,443	480,000	575,000	480,000	573,815	182,400	12,500	22,500	212,400
4	2,370,018	480,000	572,624	480,000	573,802	182,400	12,500	22,500	212,400
5	2,313,352	480,000	570,238	480,000	572,622	181,852	12,500	22,500	212,400
6	2,313,298	480,000	567,840	480,000	571,423	181,852	12,500	22,500	212,400
7	2,260,590	480,000	565,445	480,000	570,224	181,852	12,500	22,500	212,400
8	2,231,110	457,582	563,053	480,000	570,224	181,263	12,500	22,500	212,400
9	2,240,835	470,026	560,657	480,000	569,024	178,875	12,500	22,500	212,400
10	2,182,159	470,026	558,266	480,000	548,104	178,875	12,500	22,500	212,400
11	2,008,249	469,519	555,880	480,000	528,104	178,304	8,418	8,645	17,108
12	1,950,798	469,017	553,483	430,893	528,104	177,253	8,418	8,645	17,108
13	2,202,663	451,691	551,087	437,253	534,182	170,286	8,418	8,645	11,939
14	2,227,486	451,691	548,695	437,253	534,182	161,629	8,418	5,583	11,939
15	2,180,619	454,745	546,299	442,033	537,552	155,498	8,418	5,583	11,939
									235,117
									133,370
	B3021FC	B3022FC	B3023FC	B3024FC	B3025FC	B3026FC	B3027FC	B3028FC	B3029FC
0	12,500	12,500	22,500	242,400	140,000	22,500	12,500	242,400	140,000
1	12,500	12,500	22,500	242,400	140,000	22,500	12,500	242,400	140,000
2	12,500	12,500	22,500	242,400	140,000	22,500	12,500	242,400	140,000
3	12,500	12,500	22,500	242,400	140,000	22,500	12,500	242,400	140,000
4	12,500	12,500	22,500	242,400	140,000	22,500	12,500	242,400	140,000
5	12,500	12,500	22,500	242,400	140,000	22,500	12,500	242,400	140,000
6	12,500	12,500	22,500	242,400	138,211	22,500	12,500	242,400	140,000
7	12,500	12,500	22,500	242,400	138,211	22,500	12,500	242,400	138,036
8	12,500	12,500	22,500	242,400	138,211	22,500	12,500	242,400	138,036
9	12,500	12,500	22,500	242,400	136,394	22,500	12,500	242,400	138,036
10	8,818	12,500	17,324	242,400	136,394	22,500	12,500	242,400	136,399
11	8,818	8,587	17,324	242,400	136,394	22,500	17,386	242,400	136,399
12	8,818	8,587	12,311	239,720	134,489	17,394	8,458	239,656	134,635
13	5,017	4,936	12,311	239,657	134,489	12,666	12,617	8,458	239,656
14	5,017	4,936	7,798	239,657	132,919	12,666	12,617	8,458	239,593
15	5,017	4,936	7,798	236,825	132,919	12,666	7,400	4,583	239,593
									132,767
									63,572

Class III Balance for Supply Points
Table C-6